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[OFFICIAL NOTICE.]

Annual Meeting, Wisconsin Gas Association.

WISCONSIN GAS ASSOCIATION,
OFFICE OF THE SECRETARY,
MILWAUKEE, March 4, 1911.

To members of the Wisconsin Gas Association: The annual meeting of the Wisconsin Gas Association will be held in Milwaukee on May 17-18th, 1911, and it is planned to devote a considerable portion of the time to the subject of "Efficiency Engineering" or "Scientific Management." This new profession, which has recently received so much publicity in connection with the railroad rate hearing, is, of course (to some extent), only an old friend with a new title, proposing, as it does, to develop net earnings by scientific management and exact methods, instead of by the hit-or-miss methods in common use.

We are all, in a sense, trying to be efficiency engineers, in that we are constantly working to increase earnings and keep down expenses, eliminate friction and lost motion in men and machines, promote co-operation, etc., and if the efficiency engineer can enable us to do all this in a better and surer way we certainly can use him.

Some of us—perhaps most of us—have been wondering whether or not an expert analysis of our organizations and methods would disclose possibilities of profit development to which we are blind from long contact and habit, and it has been thought that, if we should all get together next May, prepared to contribute to a discussion of the matter, considerable light would be thrown on the subject. It is suggested that each member keep the matter in mind and try to bring to the meeting a statement of at least one thing he has accomplished, or hopes to accomplish, to increase efficiency, and such questions as to how improvements can be made, as have suggested themselves to him. The matter is brought to your attention at this early date, with the hope that you will think it of sufficient importance to warrant giving it some thought, and with the further hope that you will write, stating your opinion of the plan and making any suggestions which occur to you.

We need the help of every member, even if it can go no further than sending in a question for the meeting to discuss and, if possible, to answer.

[OFFICIAL NOTICE.]

Seventh Annual Meeting, Iowa District Gas Association.

OFFICE OF THE SECRETARY.
DES MOINES, IA., May 1, 1911.

The Seventh Annual Meeting of the Iowa District Gas Association will be held at Clinton, Ia., May 24th, 25th and 26th. Headquarters will be at the Lafayette Inn. Reservations should be made early. Thos. Crawford, General Manager, Clinton Gas Light and Coke Co., is Chairman of the Committee of Arrangements. The afternoon session and entertainment on May 25th will be held on a steamboat on the Mississippi river.

The following papers will be read at the meeting:

"Cokes and Oils for Water Gas Manufacturing," by Mr. J. H. Warnick, Omaha.

"Care and Maintenance of Water Gas Apparatus, by Mr. S. E. Linton, Jr., Sioux Falls.

"Gas House 'Terriers,'" by Mr. A. W. Borden, Hastings.

"Distribution Troubles," by Mr. E. M. Walker, Muscatine.

"Accidents and Damages," by Mr. J. B. Douglas, Philadelphia.

"Pressure Regulators," by Mr. Geo. A. Green, Cherokee.

"Inverted Lamps," by Mr. Walter M. Blinks, Kalamazoo.

"Management," by Mr. G. W. Clabaugh, Omaha.

"Relations of Companies to Gas Associations," by Mr. A. W. Zahm, Mason City.

"Advantages of Employees' Clubs," by Mr. H. B. Maynard Waterloo.

"New Business Development," by Mr. B. C. Adams, Lincoln.

"Why the Gas Man Should Educate the Public, by Mr. Wm. E. Davis, S. Omaha.

The following reports of standing committees will be presented:

Manufacture	Wm. J. Bertke,	Chairman.
Distribution	A. W. Borden,	"
New Business	Geo. S. Carson,	"
Uniform Accounting	G. I. Vincent,	"
Construction	J. H. Perry,	"
Membership	Campbell W. Fair,	"
Public Relations	L. L. Kellogg,	"

G. I. VINCENT, Secretary.

BRIEFLY TOLD.

OBITUARY NOTE, MR. JOHN FOWLER.—With exceeding regret we chronicle the death of Mr. John Fowler, President of the Deily & Fowler Manufacturing Company, who passed away at his home, in Philadelphia, on April 20th last. John Fowler was born in Philadelphia, in 1816, and was educated first in the public schools in that city, and later in Polytechnic College, from which sterling institution he graduated with the degree of Mechanical Engineer. On leaving school he engaged in business at once, taking employment with his uncle, the late Philip P. Deily, who had been engaged in the construction division of the gas business since 1842. Mr. Deily admitted him to partnership in 1868, in which year the firm of Deily & Fowler was organized, a corporation that in due time became known the world over where the manufacture and distribution of gas were accomplished facts. While it is true that the firm's connection with the industry was best known through particiption in the construction section of the business, and mainly in the designing and erection of gasholders, it is also true that to both principals the organization and subsequent successful operation of many gas plants can be traced. His life's work was virtually spent in the interests of the firm of which he was a founding member. The nature of its work demanded extensive travelling, and of a consequence, in his capacity as travelling member of the firm, Mr. Fowler's acquaintanceship with gas men was pronounced and his knowledge of current conditions in the industry was authoritative. He continued in active charge of the business on the death of Mr. Deily (1892), until a few years ago when he gradually relinquished the cares of trading, transferring the work to younger hands. In 1908 the Company was incorporated as the Deily & Fowler Manufacturing Company, and Mr Fowler was chosen President. Although he filled that office at the time of his death, he was not continuously active in the management of the business, after the affairs were taken over by the corporation. He was a life-long member of the American Gas Light Association, and became a member of the American Gas Institute when the latter organization succeeded to the estate of the former. He was a Knight Templar and also served on the Board of Directors of the Kensington National Bank, of Philadelphia. His immediate survivors are his widow, a daughter and 3 sons, one of the latter being Mr. J. Scott Fowler, Vice-President and Treasurer of the Deily & Fowler Manufacturing Company, to whose courtesy we are indebted for the main features of this narrative.

AN ANNOUNCEMENT FROM SECRETARY BEADLE.—Secretary A. B. Beadle of the American Gas Institute, informs us that the Chairman of the Technical Committee, Mr. Vernon F. Dewey, has appointed the following gentlemen to serve on the Bureau of Information:

Wm. Webb Offutt (Chairman),
W. C. Africa,
Herman Burgi,
A. E. Forstall,
W. H. Fulweiler,
J. B. Klumpp,
G. T. Macbeth.

The Secretary hopes that members (a hope in which we also indulge) will send in a number of problems for solution. Chairman Offutt's address is care Mohawk Gas Company, Schenectady, N. Y. Secretary Beadle further explains to us that the Editor of the Wrinkle Department is Mr. A. F. Travers, Denver, Col.

FURTHER ACTIVITIES OF THE NATIONAL COMMERCIAL GAS ASSOCIATION.—President Stannard and Secretary Stotz, of the National Commercial Gas Association, aided and abetted by the other executives of that useful body, are continuously planning for making it of better aid to its members, the latest notable move along these lines, as we are advised by Secretary Stotz, is (to use the words of the circular notification): "From now on any member of the Association who may contemplate a change of position will be at liberty to place his application on file at the headquarters of the Association without any hesitation whatsoever." It is also noted that mention will be made of the request in the *Monthly Bulletin*, if desired. * * * "In order to facilitate this work and eliminate all unnecessary correspondence, members sending applications are requested to state fully all particulars, such as age, experience, line of work preferred, salary expected and other information which will be of help in placing applications before the company seeking men." All communications will, of course, be treated in strictest confidence and should be forwarded to Secretary Louis Stotz, 29 West 59th street, New York.

A FRATERNAL ACKNOWLEDGMENT.—Mr. Vernon K. Gould, Manager of the Bangor (Me.) Gas Light Company, writing under date of the 5th inst., says: To the Editors, AMERICAN GAS LIGHT JOURNAL—Will you kindly permit me, through the columns of the JOURNAL, to thank the members of the gas fraternity all over the country who have extended their sympathy to us on the occasion of the first calamity which befel our city through the disastrous fire of April 30th. I would especially thank Manager Scott, of the Lewiston Company, and Engineer Yorke, of the Portland Company, for their timely offers of assistance; also the Welsbach Company, of Boston. The press of the larger cities have greatly exaggerated our true conditions, which were already bad enough. Our own Company has suffered some loss, of course, but nothing as compared with other business places. The percentage of poor people stricken was exceedingly small, the fire taking its course through the more wealthy localities. Gas service was maintained all the time through about one-third of the district supplied, and in the other two-thirds the supply was renewed within 40 hours of the time it was cut off. There is bound, however, to rise from the ashes of old Bangor a better, larger and more beautiful Bangor.

CURRENT MENTION—

MR. EDWARD W. STEINMUELLER, formerly connected with the engineering staff of the Chicago Bridge and Iron Company, has been appointed Sales' Agent of the Western Gas Construction Company, with headquarters in Fort Wayne, Ind.

LAST week we noted that the Springfield (Ills.) gas, electric and traction properties had been purchased by the Federal Light and Traction Company, but the real property under consideration should have been noted as existing in Springfield, O. This, also, excuses any reference to Mr. W. A. Bixby, whose interests still remain identified with those of the Springfield (Ills.) Company.

WE understand that certain Detroit interests have secured a franchise for the operation of a gas plant in Waxahachie, Tex. The franchise is to run for 30 years, and it is stipulated that the net rates for gas shall not exceed $1.65 per 1,000.

THE proprietors of the Hamburg (Pa.) Gas and Electric Company have entered into a contract with the Ball Engine Company for a Corliss type of engine up to 250-horse power, and will also install a 200 KVA Westinghouse generator, to be direct-connected to the engine, for the new power plant. It is arranged that the housing for the above shall be erected at the south end of the existing gas plant.

THE Amsler Gas Power Company will apply to the Governor of Pennsylvania, at 10 A.M. of the 29th inst., for the right to transact under such title "The business of manufacturing and dealing in gas producers, gas appliances and other kindred appliances." Those in interest are Messrs. Arthur C. Amsler, Thomas Turnbull, Jr., and Albert K. Little.

A SHORT-CIRCUIT that happened in one of the buildings of the Fort Scott (Kas.) Gas and Electric Company, the evening of the 2d inst., put the plant out of commission. This is all the more regrettable from the fact that the Company had completely reformed its electric equipment, the new outfit having been in commission only 48 hours when the untoward happening occurred.

THE Tiverton (N. J.) Gas Company went out of business the 5th inst. It was of the acetylene type, and the bid for "the remainder" was $50.

MR. W. E. HASKINS, who recently resigned the berth of Superintendent to the Rockville and Willimantic (Conn.) Lighting Company's plants, has been appointed to a responsible place on the force of the Westinghouse Electric Company, Portland, Me.

[Communicated.]

The New Showrooms in Newark of the Public Service Gas Company of New Jersey.

The new showrooms of the Public Service Gas Company of New Jersey are located on the 1st floor and basement of the Public Service Building, Broad and Bank streets, Newark, N. J. Broad street is the main thoroughfare of Newark, and the Public Service Building is only a short block from the second busiest corner in the United States.

On the main floor are located these offices of the Corporation: The Publicity Department, the Cashier's, Gas Order and Electric order Departments, the Electric Contract Agent's Office, a consultation room and a fixture display room. Public telephone booths and a

Main Floor.—Fixture Room.

writing desk are also on this floor for the convenience of consumers. The Gothic period of architecture has been followed throughout the building and the furnishings of the showroom, such as lighting fixtures, signs designating the various departments, etc., conform to this period of architecture. The walls and ceiling are in light buff, with gold-stenciled decorations. Marble is used to face the walls and columns, cashiers' cages and order counters, to a height of about 4 feet. The floor is laid in Mosaic tile. The desks, chairs, cabinets, etc., are made of quartered oak, and the tops of the cashiers' desks, and those of the order counters as well, are finished in mahogany.

Heavy bronze fixtures of Gothic design, with brackets to match, are used to illuminate the main floor showroom. In one section of the 1st floor, electricity is used for lighting; in another, gas; and in

Basement.—Fixture Room.

still another, a combination of gas and electricity. An especially pleasing feature of the showrooms, is the section set apart for the practical display of high-class lighting fixtures, domes and portable lamps. The walls and counters of this room are covered with green velour, the ceiling being stenciled with gold decorations. This is a very effective way to show lighting fixtures and reading lamps to their best advantage.

The consultation room is inclosed by green color curtains, and two settees are upholstered with the same material. In this room a customer may in comfort discuss any matter with the salesmen. It is used, however, principally by those desirous of seeing designs and sketches of fixtures, and in going over the lighting plans of their houses with the fixture salesmen. The necessary cabinets for hold-

Basement.—Ranges, Cookers, etc.

ing drawings of fixtures not carried in stock are placed in this room.

The display on the main floor has been confined to the high-priced portable lamps, fancy silk and tapestry shades, electric floral pieces, floor standards, torcheres, small electric appliances, cabinet gas ranges and water heaters. These goods are arranged in individual groups, in which way the display is more pleasing and effective.

Two large windows on Broad street, a large one and several smaller ones on Bank street, allow ample space for attractive window displays.

Copper and nickel chafing dishes, percolators, toasters, milk warmers, hot water cups, electric heating pads, etc., are shown in

Basement.—Industrial Appliances.

groups in glass cases. Decorative silk shades and electric floral effects are also displayed in a similar manner. The torcheres and piano lamps are placed in various parts of the showroom, giving individuality to the different places and adding to the decorative effect of the room as well. Electric and gas reading lamps are arranged in groups on tables placed in different parts of the showroom, a few of the higher priced domes and "showers" being displayed in the windows.

In the Electric Contract Department, fixtures are placed for the demonstration of Mazda lamps and the various shades and accessories recommended to be used with them. An attractive display of cabinet ranges and water heaters has been placed opposite the gas order counter. To make the display as effective as possible, the ranges and water heaters are placed on a quartered oak platform, a portable partition being placed back of and between them.

Basement.—Gas Kitchen.

The first floor and basement showrooms are connected by a broad marble staircase, at the head of which has been placed a very ornamental sign, directing the attention of customers to the display in the basement. Here are a number of complete exhibits, viz.: The elec tric kitchen, the gas kitchen, the gas and electric laundry, the power, gas and electric industrial appliance exhibit, the lumichromoscope, the color booths and the refrigerating and ice making plant.

Electric Kitchen.—The electric kitchen is fully equipped with all electric cooking appliances, such as range, kitchen cabinet, hot plate warming closet and oven, toasters, percolators, etc.

Gas Kitchen.—The appliances shown in the gas kitchen are those found in a gas kitchen exhibit, viz.: Cabinet range with enameled linings and glass panel doors, steam table, separate upright broiler, water heater, etc. The lighting fixtures in both kitchens are similar in design and appearance, electricity being used in one and gas in the other.

Gas and Electric Laundry.—A fully equipped laundry is shown in which are placed an electric washing machine, a gas heater, motor-driven mangle, a gas heated clothes dryer, an instantaneous automatic water heater, a refuse incinerator and gas and electric irons. The laundry is lighted by both electricity and gas.

Power Exhibit.—The power exhibit is placed opposite the kitchens and laundry, the display being arranged on two wooden platforms, and motors are connected to the various machines shown. Included are a rectifier for automobile charging, a complete wood working and air compressing plant, an electric hoist, a dough mixer, meat chopper, coffee mill, beer pump, exhaust fan, etc. As all machinery shown can be operated, the exhibit is surrounded by a metal railing for the better protection of the public. A 4-horse power gas engine is also shown.

Refrigerating Plant.—A domestic size refrigerating with ice making plant is operated daily and proves of interest to many. It is of practical use as well, furnishing ice and refrigeration when cooking is being carried on by the corporation's demonstrator during the first 2 weeks of each month.

Gas and Electric Industrial Appliances.—The space underneath the sidewalk lends itself advantageously for an industrial appliance exhibit. In this exhibit a very representative line of blast and atmospheric furnaces, and electrically-heated and motor-driven small appliances used in the various lines of manufacture, trade or profession, are shown and can be demonstrated, as they are all connected, ready for use. Whether it be a gas soldering or a melting furnace, a baker's oven or a japanning oven that is wanted, it is here. All kinds of gas or electric tailor irons, electric soldering irons, glue or wax pots, drills and motors may also be found in this exhibit.

Illuminating Exhibits.

Lumichromoscope.—Connected with the illuminating department, a lumichromoscope is shown, which affords the public an opportunity of comparing the effects of different types of illuminants on various colors. Several styles of illuminants are shown, consisting of the Carbon, Nernst and Nadza lamps, electric arc and the Moore tube, as well as four types of gas illuminants, including the Bray burner, the upright and inverted Welsbach lamps, and the inverted Welsbach lamp with amber mantle. The difference in the color values of these units is seen upon ribbons, which are placed lengthwise, each ribbon running through every booth.

Color Booths.—In the rear of the basement, 4 color booths are placed. These booths are about 4 feet square, and each booth is lighted by a 35-watt tungsten lamp. The booths are prepared in white, red, green and yellow. The object of course is to show the absorption of light by the different wall papers. These exhibits, showing, as they do, the effect of illuminants on color values and the absorption of light, have proved both interesting and instructive to those who have seen them. Vacuum cleaners are shown in operation and the prospective customer is given a practical demonstration of how to use one.

Ample space has been reserved for the gas ranges and water heaters, which are shown in two groups, mounted on wooden platforms. Cookers, double and elevated ovens, long and short cabinets, enamel lined cabinets, glass panel door cabinets—in fact, all types of domestic ranges—are shown at a selling price of from $10 to $105. A section hotel range is also shown. All of the various types of water heaters are on display.

Small appliances for the home or restaurant, such as griddle cake bakers, waffle stoves, oyster cookers, toaster, etc., are displayed on specially built tables, which are placed against the walls. A varied and full assortment of electric heating stoves and gas heating stoves, open fire places, gas steam radiators and gas grates are shown. On one of the side walls a complete line of Welsbach gas lamps used in the home are shown, fitted with plain and decorated glassware. Electric alabaster ceiling units contribute to the artificial lighting of the basement.

In the basement are displayed the less expensive gas fixtures, domes and portable lamps. The lamps are shown on tables and also on velour covered cabinets, which are also used to hold the smaller supplies sold daily.

Some of the other features worthy of mention are the electric plane and the electric switchboard. The lighting fixtures used in stores and factories and for outdoor illumination have not been overlooked, as they, too, are displayed in a fitting manner in our basement showroom. The basement is finished practically in the same way as the main showroom, including marble facing and Mosaic tiled floors. It has the advantage over most basement showrooms by reason of its receiving the benefit of much natural light and ventilation, so that the lighting and ventilation are excellent. The plan followed in fitting up these showrooms was to properly display the very best electric and gas appliances for all purposes.

[Official Report, as Furnished by the Secretary.—Continued from Page 899.]

PROCEEDINGS, SEVENTH ANNUAL MEETING, ILLINOIS GAS ASSOCIATION.

Held in the Auditorium Hotel, Chicago, March 15 and 16, 1911.

First Day—Morning Session.

The President introduced Mr. A. F. Blossey, of Alton, Ills., who read the following paper on the

OPERATION OF AN AMMONIA STILL.

Since it is not within the province of this paper to give costs of installation, nor yet of operation—for these vary with the kind and size of still, the locality, and especially the method of operation—you will be content with the barest limit to which the subject can be confined. It will be necessary to introduce a few points, however, that will lap the cost line. There is the ideal fuel consumption required per ton of coal carbonized, as laid down by the manufacturers of stills, against the real fuel consumption; the cooling water is also a consequential item in some places, and cost of labor must likewise be taken into consideration. It will be necessary to also introduce accessory appliances: The hydraulic main, condensers and scrubbers, and storage tanks. Without proper saving of the crude liquor, the very best operation of a still would appear to be a failure.

First let us assume that the question of installing a still has come before the advisory board of a small gas plant. The superintendent, having the best interests of his employers at heart, has recommended the installation, and, to back his claim for the extra earning power of the appliance, has procured and arranged a vast quantity of data on costs of installation and on earnings on investment.

Now, grant that the figures, backed by eloquence and supposed knowledge, have won out and that the material for the still has arrived. In the estimate the cost of erecting the apparatus has been purposely decimated, for the superintendent has had experience in concrete and structural work. By the help of cheap labor, to do the strong acts under personal direction, a material saving is to be made. At the end of a month there are still many minor connections to be made, while the labor item has far exceeded the allowance in the proposed expenditure. On the day for testing out the still, he appears on the job early, armed to the teeth, with manufactured instructions. During the 18-hour run he discovers: That the retort house men either question their capacity to operate so complicated a machine, or fear that extra work will be required of them; probably the latter. That it is absolutely necessary to keep a constant pressure on the steam line, while the 30-horse power boiler, fired at the convenience of the retort house men, and, with breeze and slack for fuel, fluctuates between 50 and 80 pounds pressure; that there is a big waste of cooling water, which keeps the meter humming up a record at a comfortable price per 1,000, and that at the overflow to the concentrated liquor tank, the liquor, which is already contracted for on the 15 per cent. basis, is at best but 6 per cent.

With the help of his all round man, usually called the pipe fitter,

he attacks the probl ems. On the lower section of the absorber, adjacent to the seal pot, he attaches a swinging overflow pipe. When the liquor is weak, the pipe is to be lowered to a connection with the seal pot, and the liquor be returned to the crude liquor tank. Raising the connection will again force the liquor through the regular outlet. A test having revealed that the crude liquor in the underground tank is at almost a constantly low temperature the year round, while the city water becomes too warm in summer to be effective for cooling purposes, the liquor is utilized in the condensers. A small length of pipe fitting diverts the cold liquor to the upper cooling sections of the absorber before discharging it into the top section of the volatile still. The change serves a double purpose. The cooling water required in the lower sections of the absorber is cut to a minimum, and the crude liquor is very sensibly preheated before entering the volatile still.

The boiler proves to be the next greatest problem. There seems nothing for it but to provide a better grade of fuel and more regular firing. And the firing question brings him to the real problem—the men. Every successful gas man knows that what he must have above all is not operation but co-operation. And with this maxim in mind, he approaches the foreman of the two shifts at the changing hour, with a "Now, men, let's show 'em that we can conquer the brute." A list of instructions on how to start, operate and stop the still is left with them, with the understanding that the instructions are guides, not orders. A suggestion to the night man to "try his wings," finds the still hot and ready for an early start in the morning.

Though things appear to run smoothly, and all minor troubles are conquered, the superintendent finds at end of the month that he has recovered only 2 or 3 pounds of ammonia out of a possible 4 or 5 pounds per ton coal carbonized. The steam coal which has been entered in the operating expense account at 14 pounds per ton coal carbonized, proved to be fully doubled. Also the labor account (which should be nil) is a very material item. Later on follow pump lubricant and repairs, valve and cock repairs and renewals, extra labor for cleaning and overhauling still, until the earnings' balance has become so small that the management calls for an explanation.

The problem now is to discover the leakage of those extra pounds of ammonia. Beginning at the hydraulic, the cold water is substituted by a hot circulating system. The tar ammonia separator is carefully regulated and watched. The scrubber circulating system and the flush regulation are systematically operated and adjusted. Tests at regular intervals are made at outlet of No. 2 scrubber and the whole still is carefully tested for any possible leaks.

Persistent and systematic following-up necessarily brings results, and unless he, or one of his men equally interested in getting results, makes it his daily duty to look after the seemingly small matters, the yield will drift back to the 2-pound mark, or even lower.

For convenience, the superintendent and the foreman of a gas plant should have a pocket memorandum of useful notes, personally gathered from manufacturer's bulletins, hand-books, journals and from personal observations. Among these notes could be placed the following approximate conversion table:

Strength. Oz.	Wt. per Gal. Oz.	Wt. per Gal. Lbs.	Hydrous Am. NH_3. Per cent.	Twaddle Degrees at 60° F.	Sp. Gr. Water Basis.	Wt. of Gal. at 60° F. Lbs.
0....	0.000	0.0000	0.0000	0.0	1.0000	8.3328
1....	0.347	0.0217	0.2581	0.5	1.0025	8.356
2....	0.698	0.0434	0.5182	1.0	1.005	8.377
4....	1.388	0.0868	1.0364	2.0	1.01	8.418
6....	2.082	0.1301	1.5546	3.0	1.015	8.460
8....	2.786	0.1735	2.0728	4.0	1.02	8.502
10....	3.469	0.2169	2.591	5.0	1.025	8.544
24....	8.328	0.5205	6.2184	12.0	1.06	8.835
28 ...	9.726	0.6079	7.2548	14 0	1.07	8.918
32 ...	11.104	0.6840	8.2912	16.0	1.08	9.002
36....	12.492	0.7807	9.3276	18.0	1.09	9.085
40....	13.878	0.8676	10.364	20.0	1.10	9.168
44....	15.265	0.9544	11.4004	22.0	1.11	9.253
48 ...	16.654	1.0411	12.4368	24.0	1.12	9.336
52 ...	18.041	1.1276	13.4732	26.0	1.13	9.420
56....	19.429	1.2143	14.5096	28.0	1.14	9.503
60 ...	20.816	1.3014	15.546	30.0	1.15	9.586
70....	24.286	1.5179	18.137	35.0	1.175	9.795
80....	27.755	1.7352	20.728	40.0	1.20	10.004

Printed or type-written instructions, made as terse as clearness will allow, should be mounted near the still for ready reference. These instructions should include every step necessary in starting, operating and stopping the still—every valve or cock that is to be opened, closed or oiled, and when; the necessary pressure and temperature in the various parts of the still; the strength of liquors and lime water, and how much to introduce and when; the vital importance of keeping the crude liquor overflowing at the seal pot. Remember that, to a novice, the still is a complex machine. You find that even your older men know very little about the real workings of it. So do not blame the retort house men if the operation is not entirely satisfactory for want of, what seems to you, a simple twist of the wrist.

Very exhaustive instructions for installing and operating a still are furnished with each machine by the manufacturer, or may be had for the asking. You are apt to follow these in a general way. The same may be said about construction. The steam regulator can be profitably replaced by a plain globe valve with metal disk. The valve is more reliable, easily adjusted and cheaply repaired or replaced. Plain iron cocks are preferred to the high priced ammonia valves for like reasons. Wrought iron pipe should supplant lead as far as possible—the lead to be used only where expansion requires it; tees or crosses, in place of plain ells, especially in the vent pipe, will facilitate steaming in case of salting. The old advice to steam out the whole still to dissolve the acid salt is absurd. A 12-foot length of steam hose and a convenient steam opening will make it possible to relieve local salting in a few minutes without overheating the absorber. The pipe to the concentrated liquor tank should be steamed about once a month to insure a free flow at all times.

It should not be necessary to take off a hand-hole plate within a year to remove pitch or lime. Careful regulation of the tar ammonia separator will almost exclude tar from the crude liquor tank. A few minutes' hand pumping from the bottom of the tank before each distillation will remove the trace of tar that went over in suspension. A daily blow off from the bottom of the liming leg will keep the machine clear during the operation. The present methods for injecting lime are far from satisfactory. A device whereby quicklime can be introduced directly into the leg at short intervals would be a decided improvement. Many other points about the present construction of ammonia plants are not satisfactory. Distillation being a simple process, why should the machine be complex? Steam is an expensive necessary agent, yet its energy is flagrantly dissipated from large, uncovered radiating surfaces. Perhaps, right here, you will be interested in some experimentally derived data on the quantity of steam used to distill crude liquor. For the sake of brevity, computations will be omitted and the results only be given.

The method employed to obtain the value was by passing the steam through a standardized nozzle and computing the number of feet of flow per minute. Remember that the crude liquor was introduced in a sensibly heated state, otherwise the steam consumption would have been still greater.

Crude liquor distilled per minute.....	17.5 lbs.	
Steam supplied per minute.....	4.033 lbs.	
Heat units in 4.033 lbs. steam	4,763.38	
Heat units used on 17.5 lbs. liquor	2,173.30	
Heat units lost in still.....		2,590.08
Heat units discharged with waste.....	333.07	
Heat units in concentrated liquor.....	259.87	592.94
Heat units lost in radiation		1,997.14

From these significant figures you gather that nearly half the heat supplied is dissipated through radiation.

Ammonia stills—stacks of cast iron laminae—are fit monuments to the engineering skill of the past 50 years. And it is a pretty compliment to the gas men of the corresponding period that they blew steam into these monuments and didn't know that they were operating a heating plant. And yet the ammonia still, even in its present state of inefficiency, is a paying asset.

For comparative data, take a 3,000-ton plant. Assuming an actual saving of 4.5 pounds ammonia per ton carbonized and a sale price of 7 cents per pound f.o.b. cars, the gross returns would be $945, and the cost of making marketable ammonia would be:

Steam coal necessary for still only.....	$90	
Steam coal for pumps, lime, heat, etc,, estimated..	20	
Interest and depreciation on $3,000 at 10 per cent..	300	
Extra labor for cleaning, operating, etc	150	
Lime (2 pounds per ton), 30 barrels at $1....	30	
Repairs, renewals, changes, contingencies.....	40	$630
Yearly saving.....		$315

The operation of the ammonia still requires not only that all the ammonia be absorbed from the gas and the liquor carefully collected, but that all leaks in tanks and still be hermetically repaired, and that careful attention be given to every step in the running of the still proper. It c lls for personal attention, tact, persistence, originality.

Discussion.

The President—Mr. Stillson, will you discuss the Blossey paper?

Mr. Stillson—As the majority of us are concerned with facts and figures, I feel it is a loss to the members of the Association that Mr. Blossey was so limited by the committee on papers that he felt duty bound to give us simply the high lights in the operation of the ammonia still, and did not feel that it was within the province of the paper to give the exact costs of its installation. I feel, however, in this discussion we will be permitted to bring out some of these points and, while none of them can be explained in detail, owing to the shortness of time for discussion, there is plenty of literature on the subject to which one can refer. It is quite important at times that all of us should know something of the concentration of ammonia liquor and its connection with the coal gas industry, and be able to state limits to one who is building or operating a plant in which it would pay him to install a concentrator. Chemists and concentrator builders tell us that any plant carbonizing from 6 to 8 tons or upwards can afford to install a concentrator. In my experience, however, 6 tons is much too low a limit, but considering the different kinds of concentrators that may be had, I would say a plant carbonizing from 10 tons upwards could safely afford one of the three following methods of concentration: 1. For plants of small capacity, an intermittent still, which can be of very simple construction and which consists merely of a boiler holding a certain quantity of ammonia liquor, and into which is put the proper proportion of slacked lime, and as accessories, cooling coils for the excess steam and vapors of ammonia, and which delivers a fair strength of concentrated liquor to the storage tank. 2. The continuous still for volatile ammonia alone is somewhat cheaper than those which have the additional apparatus for the removal of the fixed ammonia, comprising about 16 per cent. of the entire liquor. 3. For plants of 25 tons daily carbonization and upward the continuous process for the recovery of the volatile and fixed ammonia compounds will generally prove the best investment. I agree with Mr. Blossey that, in attempting to prepare a paper on operating costs, one immediately gets into deep water owing to the fact that few stills in small plants are efficient. Some general figures have been obtained that will likely be of interest to the readers of this paper. Theoretically about 70 pounds of steam per ton of coal carbonized will be required to concentrate liquor from 1½ to 18 per cent. pure NH3. Allowing a safe efficiency of 75 per cent. for the average still, we would have a consumption of 100 pounds of steam per ton of coal carbonized. This may be considered average practice for a small continuous still for fixed and volatile ammonia, running 24 hours per day. The boiler horse power thus required for a plant with a daily capacity of 50 tons of coal carbonized would be about 7 for a 24-hour period and about 14 for the same sized plant on a 12-hour period. The fuel consumption can thus be readily calculated. In many plants doing their own pumping the value per cubic foot of water is not high; but, in a plant where the water is metered, the cooling water used in the condensers and absorbers can be run to a hot well and then direct to the boilers or to the water system of the plant. For larger stills, the preheating process, in which cool liquor is admitted to condensers, is most efficient. The quantity of lime used, which can be calculated rather closely from the figures given in the test in Mr. Blossey's paper, should be carefully chosen, although it is not of importance unless a very poor lime is likely to be obtained. Impure or slacked lime simply requires more time and lessens the daily output of the still. Something also should be said regarding the chemistry of ammonia making and of the ammonia compounds in coal. Theoretically we should get about 7 pounds pure NH3 per ton, but the average practice is from 4 to 4½ pounds per ton, and even that accounts for only 24 of 1 per cent. of the total N. It is a well known fact, however, that in forcing the yield of gas above 5 cubic feet per pound of coal a lower yield of ammonia results. Consequently, one must carry constant heats in the retorts; not too high, or heats such as decompose NH3 and probably form cyanogen. From the gas works apparatus we get volatile and non-volatile ammonia compounds, some tar and light oils. The carbonates, sulphides, cyanides and possibly chlorides are the non-volatiles. We must provide a skimmer to remove the tar and oils, either at the overflow into the ammonia well or on the gas liquor pump suction, for tarry matters produce pitch, giving trouble in the still, the light oil yielding a poorer grade of concentrated liquor. If the plants are of sufficient size, one should resort to frequent tests of the weak liquor and, in the small plants, one should submit now and then a sample of the weak liquor to a chemist to determine the amount of lime necessary to remove these fixed ammonia compounds. There are two or three simple methods of determining the proportions of fixed and volatile ammonia compounds in our liquor and also for checking the strength of the concentrated article. This last method—namely, the titration of a fixed amount of liquor and normal sulphuric acid—should be used frequently to ascertain the quantity of ammonia and action of the still. The Twaddle hydrometer is useful, but not absolutely accurate about the different apparatus and the still. From this you can keep your events fairly constant and give your instructions to your works' foremen concerning the strength of liquor from the various apparatus in the plant. This also gives you better control of the operation of the hydraulic main and auxiliaries and the quantity of fresh water and liquor to be introduced into the scrubbers. It must be borne in mind, however, that the specific gravity of the various salts is heavier than that of water, and that the specific gravity of the solution of ammonia gas is less than water, so that the Twaddle hydrometer is in error when used in estimating the strengths of a combination of ammonia compounds. The metering of concentrated liquor made by the still is another simple check to satisfy the superintendent that the still is being operated to a fair capacity. This is done by providing the foreman with a diagram, showing the rise of liquor in inches each day in the tank, converted to gallons. The chemistry of the action of the milk of lime upon fixed ammonia compounds is interesting to the superintendent, if not the foreman. Take this typical illustration, regarding the reaction of ammonia sulphate with milk of lime:

$$(NH_4)_2SO_4 + CaO = CaSO_4 + 2NH_3 + H_2O.$$

Solving this equation by substituting the atomic weights (for CaO and $2NH_3$), we find theoretically 1.3 pounds of pure lime will be required per ton of coal carbonized. This weight of lime is a very important matter, and in many instances is left too often to guess work. In practice, 1.5 pounds is nearer correct. A very good way is to have the ammonia man on each shift prepare ¼ the amount of lime required for 24 hours and be responsible for the introduction of a certain amount per hour from mixing tank by means of a carefully graduated scale in inches. A good proportion is 70 pounds quicklime to 100 gallons water. This ordinarily produces milk-of-lime of the density of 8° T. (which is handled very well by either an injector or a continuous pump), and it is of importance to maintain milk-of-lime of constant density. The sewage should be tested quite frequently by the odor, which test though rough is effective; or, more accurately, if the size of the works warrants, by qualitative tests, described in text books on the subject, in like manner as weak concentrated liquor is tested. These tests should also be frequently applied to the liquor drawn from the purifying boxes. If the yield does not meet your anticipations, the most important fact of all has been overlooked, which is leakage of ammonia gas or liquor from the gas works apparatus. Do not allow any liquor overflow to be uncovered. Allow no leakage nor careless handling of weak or strong liquor in cleaning or operating any apparatus; and above all, keep the entire plant free from an ammonia smell. The hydraulic main must have constant attention. Dump regularly, not allowing any liquor to remain in the hydraulic main until strong enough to damage iron work and waste by salting. Keep a good liquor seal on the hydraulic main, for the strongest liquor comes from here. Carry even heats, and use a carefully graduated system of apparatus temperatures, so that each portion will do its share in performing the proper functions. Carry constant pressures. Keep all the apparatus clean and working properly through systematic examination and cleaning of each piece, determined by the duties and operating conditions. Determine carefully amount of scrubbing water required and regulate temperatures by the condensers rather than by the scrubber water. The matter of scrubber design is quite important, but cannot be discussed properly with this topic. The above applies to plants of fair size, having nearly perfect balance in apparatus, although I presume there are many that have not, and from these latter plants good results cannot be expected. The starting, running and stopping of the still have been handled very well by various contributors to the gas literature. A very good paper, regarding the action of the still has been written by Mr. George Osius.[1] The fact brought out, regarding care of gas works apparatus, is particularly emphasized and the operation of the ammonia still is best run, according to the old adage: "First catch your hare, etc.;" for, no matter how well designed the concentrator, careless operating will entirely defeat the best intentions of the superintendent or engineer. Last, but not least, is the care used in ship-

1. American Gas Light Journal, Vol. XL.

ping your liquor. Theoretically, the higher the strength the less the freight rate per pound of NH_3, but practically, there is a limit, which is generally found close to 15 or 16 per cent. liquor, according to distance and time of year shipped. If weaker than this, the cost of freight will be excessive, A little picturing from my own experience will illustrate the loss incurred upon one tank from salting enroute; however, not by my own company. A car was received at our plant having 8 inches of salt in the bottom of the tank that had not been removed. We removed it, but the profit was slight as the job was costly.

The President—I believe some of you coal gas men have some fur ther remarks to make on this topic. Does anyone else desire to discuss this paper? If not, we will call on Mr. Blossey to close the discussion.

Mr. Blossey—I purposely avoided taking up these other points that have been threshed out so much by various writers, such as the saving of the liquor up to the time of the closing down of the still, and even testing and shipping. I have simply endeavored to make a point in a few words of the loss of heat in the still itself and by a thorough test that was made to show that an ammonia still is really a little heater instead of a still only, and that we are losing a great deal of heat by radiation. It has been claimed by various authorities that it does not pay to insulate the still. Be that as it may, I found it to be a fact that the still is a radiator on a large scale. As stated before, the conversion table is not strictly accurate, but is convenient to give a general idea of values. The temperature of the liquor must be in the neighborhood of 90° to 100° F. in order to give the results. The testing of the liquor can be done by any one from the instructions given by the manufacturers of the stills. They give us the apparatus with instructions necessary, and so we should have no trouble. It is simply mechanical.

The President—Gentlemen, is there anything further to be said in regard to Mr. Blossey's paper? If not, Mr. Blossey, I am sure the Association is indebted to you for your paper and appreciates it very much. The next order of business is the

Report of Nominating Committee.

The report was presented by Chairman Eustace as follows: Mr. President and Gentlemen, your Committee beg to report the following nominations agreed upon, for the ensuing year:

For President.—C. B. Strohn.
" *Vice-President.*—R. C. Dawes.
" *Secretary-Treasurer.*—F. E. Newberry.
" *Director* (2 year period).—W. E. Hartman.
Representative to the American Gas Institute.—A. S. Harrington.

Your Committee also beg to recommend that the Secretary's allowance be increased from $60 per year to $200 per year.

Election of Officers.

The President—You have heard the report of the Nominating Committee, which I think is a good one, save the possible exception of myself. What is your pleasure as to the method of casting the ballot?

On motion of Mr. Rew the Secretary was instructed to cast the ballot of the Association for the election of the officers named by the Nominating Committee. [Seconded.] The Secretary subsequently reported that he had acted according to instructions, and the President announced the result. Closing his announcement with the remark that they would like to hear from the officers elect.

Response of Mr. Strohn.

Mr. Strohn—Fellow members of the Illinois Gas Association: I, of course, thank you for this honor; but it is very hard for me to say which gives me more pleasure—accepting the office of President or giving up the Secretaryship. [Laughter and applause.] If I have ever done anything in behalf of the Association that might be called work, I certainly now feel amply repaid. [Applause.]

Mr. Newberry's Acknowledgment.

Mr. Newberry—Mr. Chairman and Gentlemen: It is indeed a pleasure to me to receive this appointment. It comes unexpectedly. Mr. Strohn says it is quite a pleasure to get rid of it. I hope that I may possibly be able to take care of it as well as Mr. Strohn has done. I have always wondered how he took care of the arduous duties of this position as well as he did. I do not know about this increase of salary. I won't say too much about that, however, as that has not gone through yet. [Laughter and applause.] But I should like to say that it will be acceptable.

The President—Gentlemen, you have heard the recommendation of the Nominating Committee to increase the salary of our Secretary to $200 per year.

On motion of Mr. James the recommendation respecting an increase in salary of the Secretary (seconded) was adopted unanimously. A motion to take a recess, to terminate at 2 P.M., was ordered.

First Day—Afternoon Session.

The convention reassembled at 2 P.M., President Harrington in the chair, who announced that the first order of business was to have been the report of the "Public Relations Committee," but action thereon had been deferred until the following morning. He then introduced Mr. C. S. Heath who read the following paper entitled

THE UTILITY OF THE PYROMETER ON CARBURETTED WATER GAS MACHINES.[1]

The pyrometer is an instrument which is used to measure comparatively high temperatures, such as would be found in blast furnaces, muffle furnaces or retorts, reverbratory furnaces and in gas machines. In connection with the first three furnace mentioned (blast, muffle and reverbratory) the pyrometer has been used for some time as an aid to the daily operations, and considerable literature has been written about the pyrometer as used with those furnaces, but the use of the pyrometer in the daily operation of gas machines is hardly past the experimental stage, and practically no literature can be found upon the subject. It is, therefore, the intention of the author to set forth some of the observations made and results obtained in the daily use of the pyrometer since it was first installed in a gas machine under his supervision; namely, since September, 1908.

This article is not intended to be a purely scientific treatise on the subject to be discussed, but one which will be of practical value to the man in charge of a gas plant, essaying to give a clearer understanding of the conditions and temperatures found in water gas machines, and to disclose such improvements in the operation of the machines as have been the result of the use of the pyrometers. Consequently, in various parts of the paper commercial terms, which are readily understood by men in the gas industry, may be used instead of a scientific expression of the same conditions.

For reasons which will be apparent in the discussion of this paper, the class of pyrometers most adaptable to our use is the thermo-electric type of pyrometer, consisting of a thermo-electric couple or fire-end, a temperature indicator and a temperature recorder connected in parallel to the fire-end by copper wire. The principle upon which the electric pyrometers are built depends upon the fact that, when two wires of unlike metallic composition having differing electrical conductivity are welded or twisted together at one end, and this end is subjected to heat, a difference in potential is set up in the cool ends of this thermo-electric couple. If these ends are connected together by copper wire an electric current is established through the wire, traveling from the point of high potential to the point of low potential, and when a milli-voltmeter (or galvanometer) is placed in the circuit the strength of the current may be accurately measured. When two instruments are placed in parallel so as to read the temperature from a single fire-end or thermo-electric couple, one instrument (for example, the indicator used by the gas maker) is a milli-voltmeter, and the other instrument (such as the recorder in the superintendent's office) is a galvanometer.

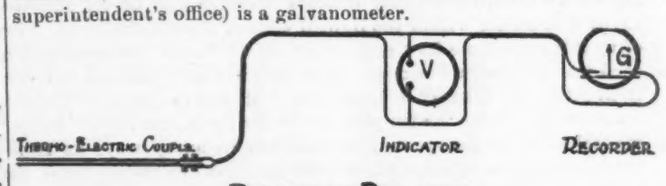


Diagram of Pyrometer.

The strength of the current is proportional to the difference in potential set up in the thermo-electric couple and this difference in potential is proportional to the difference in temperature of the hot and cool ends of the couple. Hence, if the cool ends are kept at a constant temperature the readings on the milli-voltmeter and on the galvanometer will be directly proportional to the temperature of the twisted or welded ends. By proper calibration of the two instruments they may be adjusted to read directly the temperature of the hot junction in degrees F. or in degrees C. It is readily seen that the two wires of the fire-end must be insulated from each other, to avoid the danger of partial short circuits due to the difference in potential

1. The photographs of the accom anying illustrations were taken by Mr. G. C. Elmberger, and the drawings of the 3 types of gas machines are by Mr. T. W. Goodrich.

of any portion of the wires which may be cooler than the welded end. The wires of the thermo-electric couple may be made of various metals depending largely upon the temperatures to which the couple is to be subjected, although as a rule one wire is a single metal and the other is an alloy, such as the platinum and platinum-rhodium couple, the iron and copper-manganese couple or the nickel and nickel-chromium couple. The composition of the gas which surrounds the couple has no influence on the indications of the instruments.

The purpose of the pyrometer in the gas machine is primarily to aid the operator in maintaining uniform temperatures ("heats," according to work's parlance) in the various parts of the machine, at the best temperature for making gas of a desired quality; and, secondarily, to keep the general superintendent in touch with the operations of each gas maker on both day and night shifts, as shown by the recorder instrument. The object of this paper may be divided into the following classification:

1. A determination of—

a. The most efficient temperature to maintain in manufacturing gas of certain quality.

b. The effects of carrying other temperatures.

c. The range of temperature practicable.

d. The limitation of theoretic operation by practical difficulties.

2. Illustration of a method of installation of the pyrometer, so that:

a. The superintendent while at his desk in the office may always be in touch with the operations of the gas makers.

b. The gas makers may readily watch and control the temperatures in the various parts of the machine without leaving the operating valves.

3. A determination of the exact temperature in various parts of the machine while in operation, in order that we may have a clearer and more accurate understanding of gas machines.

4. An exemplification of features other than the temperatures of operation, whereby the use of a pyrometer has been of benefit in practice.

5. A discussion of the results obtained and of subsequent improved methods of operating the machine, which are primarily due to the aid of pyrometers, in such a manner as will be of interest to the average gas man, and will aid him in an understanding of machine operations even if he has no intention of using a pyrometer in his plant.

Before discussing the question of temperatures most suitable for the proper and practical operation of gas machines it may be well to describe a few of the ordinary conditions and troubles encountered before the pyrometer was used. At that time the gas maker was required to go down stairs to the floor below the charging floor and walk around his machine (in the case of type No. 2) or to climb up two flights of stairs and walk around his machine (in case of type No. 1) to sight-holes where he might look into the machine and judge whether the brick were too hot or too cold; or, whether the oil spray in the carburettor was working properly or was causing "dark streaks" through the checkerbrick. It will be readily seen that the operator could not make this trip very often and attend to other necessary work, such as proper adjustment of primary and secondary blast valves, regulations of steam pressure and of oil admitted to the carburettor within the limited time of these operations. Very often it is impossible for the foreman to watch the temperatures in each machine, as he has many other duties which demand his constant attention. It may be noted that in stating the fact that the gasmaker would judge the temperature of the brick, the word "judge" was selected, for the eye may be deceived in many ways as to the true temperature of brick surrounded by a gas or gaseous vapor, and judgment at its best, as we all know, is subjected to the personal equation. If one authority would say a machine was too cold and another would say it was too hot, what should an ordinary gasmaker do? There is no personal equation to a pyrometer and, as previously stated, it indicates the true temperature irrespective of the surrounding gases.

Before the instruments were installed the life of the machine was from 800 to 1,000 hours, due to the formation of lampblack in the superheater. The checkerbrick would often become so thickly coated with carbon that the resultant back pressure would decrease the amount of gas made to a marked degree. Often the machine had to be shut down for 2 days at a time in order to burn out some of the carbon by admitting air through the checkering doors. When the machine was let down for repairs the bricks would be covered with carbon and ash, burned so hard as to require a pick, or sledge and bar at times, to remove them from the upper part of the superheater. Strict attention to the temperatures carried in the operating machine and every other known precaution were employed to overcome these conditions without any results until the pyrometer told the story. The condition that the pyrometer revealed will be discussed and illustrated in the following paragraphs.

Upon the introduction of pyrometry in the gas industry in Chicago we found three points had to be considered in placing the instrument. First, the best position of the fire-ends in the machine; second, the most accessible position of the indicating instrument for the gasmaker; third, the most desirable position of the recording instrument for the superintendent. It was necessary to have two sets of fire-ends in each machine to control the temperatures properly, one in the carburettor and one in the superheater. The carburetter temperature was taken from its lower part, while the superheator was taken from the top, which at that time considered, and usually is, the hottest part of the machine. The two indicator instruments (one for the carburettor and one for the superheater) were placed directly in front of the gasmaker's stool, and beside the gauge board, as is illustrated in Plate No. 1, and connected to the fire-ends by copper leads 90 feet in length. The recorder instruments for the various machines were placed along the wall in the superintendent's office, as illustrated in Plate No. 2, and connected in parallel with the indicator instrument to the fire-ends by copper leads 600 feet in length, which fact illustrates the adaptability of the the thermo-electric pyrometer. By this arrangement the gasmaker can watch the temperature rise or fall at all times without leaving his operating valves. He can, therefore, regulate his primary, secondary and superheater blast valves as con-

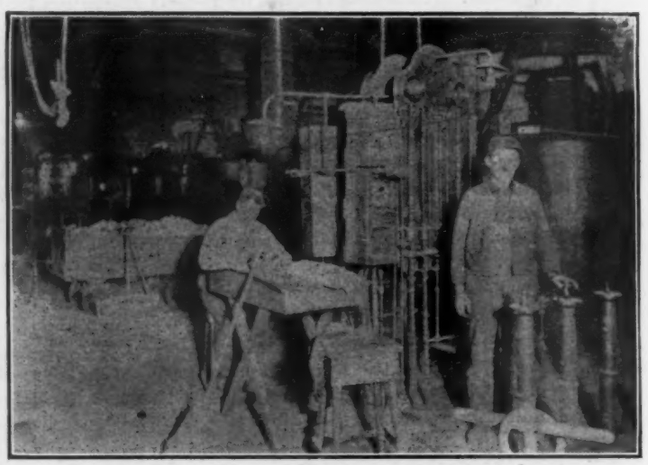


Plate I.—Pyrometer Indicators in Generator House.—(Instruments are located in the center of the picture between the gas maker's desk and the gauge board—the upper one for the superheater and the lower for carburettor.)

Plate II.—Four Pyrometer Recorders in Office of Gas Works.—(The instruments are located on the wall beside the superintendent's desk fully 600 feet away from the gas machines in the generator house.)

ditions demand, instead of operating by a "rule-of-thumb" method. The superintendent by simply turning in his chair is in constant touch with the generator house. He can tell at a glance which machine is down for cleaning; how long each has taken to clean; how the cleaning time compares with the record of previous days; what temperature is carried by each machine in operation during the present run and for any previous run; which machines may not be in operation and how long they have been shut down; what temperatures were carried during the night shift; and how long a machine has been down for repair work. The recording chart may prove of value in case of dispute as to the exact time an accident had happened on a machine, and the length of time required to make repairs, especially if the occurrence was during the night shift.

When the first instrument was installed at Pitney Court Station the temperature at the bottom of the carburettor was not carried as uniformly as we now carry the temperatures. (See Plates 3 and 4 for comparison.) It may be noted that, with the pyrometer newly installed and before the gas maker knew its purpose, the variation in temperatures while the machine was in operation was not excessive, being less than 100° for the 24 hours, excepting for the period just after cleaning, when the temperature had to be carried low in the carburettor (by blasting more on the fire and using less secondary blast) until the superheater was cooled down to a cherry red color desired. We observe by means of the superheater indicator that the temperatures of the upper courses always increase to 1,600° or 1,800° during the cleaning or clinkering time, an increase of as high as 400° above operating temperatures. This was also noted in the carburettor (as shown by records, Plate No. 5) although not always to such a marked degree as shown in the superheater. When you are informed that it requires from 6 to 10 hours to bring this excessive temperature down[1] to the desired 1,350° in the superheater (although the carburettor temperature can be reduced in about an hour) you can readily understand that this is the period during which coke is being wasted and lampblack formed with the resulting loss of candle power in the gas manufactured.

Plate III.

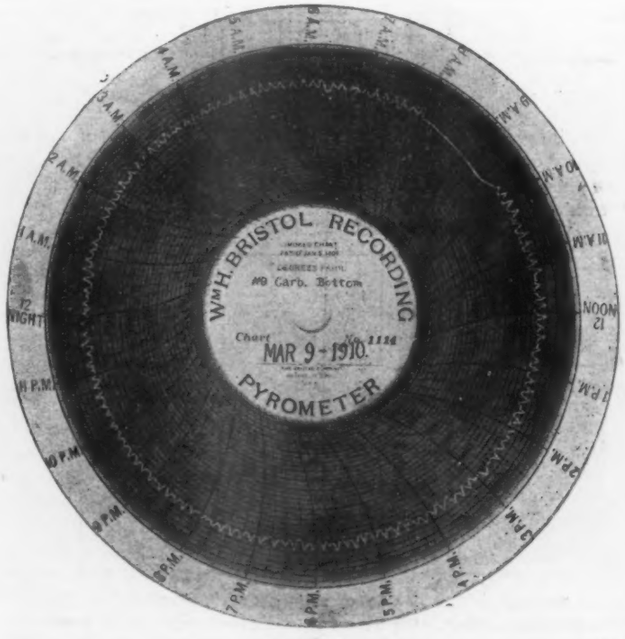


Plate IV.

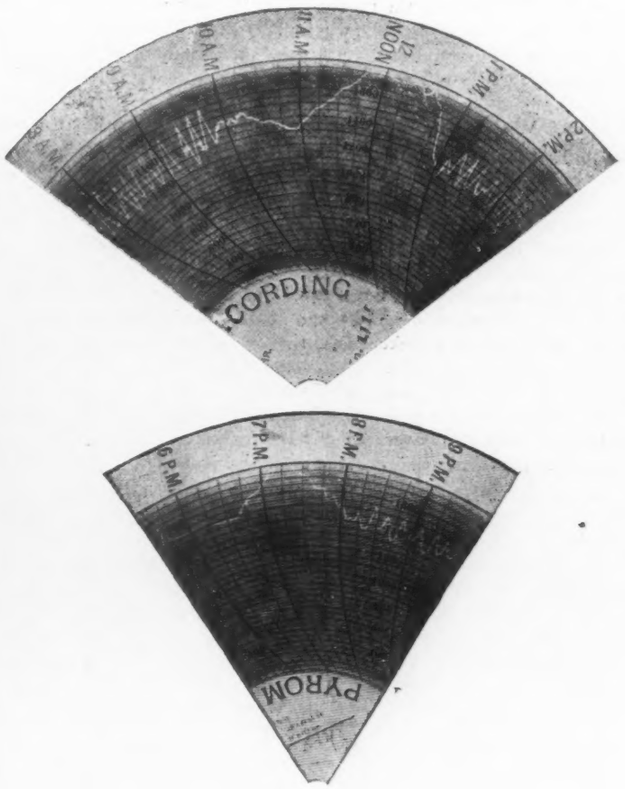


Plate V.

Improvements in the methods of handling the machine were then devised to prevent this increase of temperature in the brick work during clinkering. The gas machine had been allowed to stand open to the circulation of a natural draft of air through the carburettor and superheater and out the stack. This air would burn any fine coke dust or lampblack which may have lodged on the brick during the previous period of gas making and thereby raise the temperature of the brick far above good operating conditions. To overcome this trouble the circulation of air through the machine was stopped, on some of the machines by closing down the purge cap and on the others by closing the up-and-down run valves in the hydrogen pipe between the generator and carburettor, according to local conditions. (Note. Before starting to blast through the the machine after clinkering a small amount of steam was turned on to cause a circulation through the machine and prevent small explosions of the gases which may have formed.) By this operation an even temperature was maintained in both carburettor and superheater while the stokers were removing the clinkers, but as soon as the blast was put on the

1. By means of careful manipulation of the blast values, such as increased primary blast (because the temperature of the fire is low after cleaning) and decreased, or often no secondary blast with a large loss of heat and waste of coke from excess gases burning at the stack.

generator the excess air for the first few minutes while the fire was still cold would cause an increase in temperature in the machine for the same reasons. This trouble was not so bad, as it only took about an hour or two to bring the superheater temperatures down to operating requirements, but since the best operating conditions are none too good from the very first minute that gas is being made and sent into the holders, it was decided to blast on the fires until they were hot enough to make gas without allowing the excess air or comparatively cool blast gasses to pass the carburettor and superheater. To accomplish this the charging doors on the top of the generator were opened and the blast gases allowed to pass through until considerable flame showed above the top of the coke. The primary blast valve was then closed, the up-run valve in the hydrogen pipe or the purge cap as the case may be was opened, the charging doors were closed, a small amount of steam turned on for a moment, the primary blast valve finally raised, and the entire machine was then in the best operating conditions before a cubic foot of gas was sent into the holders. With these changes in the operation we find that the temature in both carburettor and superheater is almost constant during clinkering, excepting for the slight loss due to radiation. See Plate No. 4—cleaning time from 8:05 A.M to 9:45 A.M.; also Plate No. 14—cleaning time from 10:10 A.M. to 12 M.

By these improvements in the methods of handling the machine (which you will note can hardly be called a change in operation during gas manufacture, but rather was a change in the conditions of the machine while idle and when no one would think of watching the temperatures of checkerbrick) the life of the brick has been increased about 100 per cent. and in some cases as high as 175 per cent. and the brick are now quite free from lampblack when the machine is let down for repairs and recheckering. There is no time lost for gas making as there is no necessity of burning out any lamp black in the machine. Plate No. 6 shows the clear cut outlines of the brick as

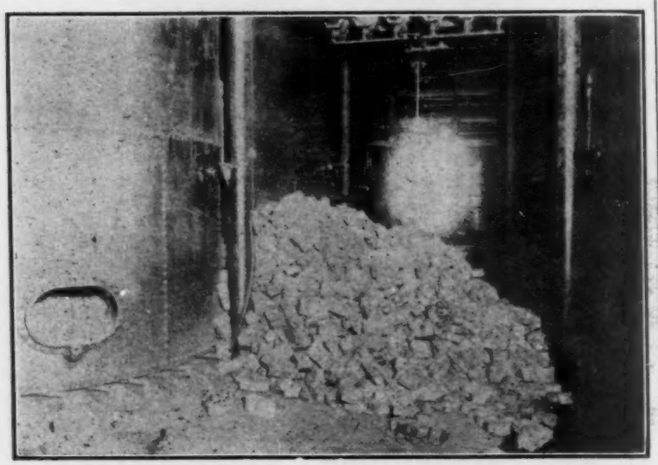


Plate VI.—Checkerbrick from 11-Foot Machine Using Pyrometers.

removed from an 11-foot water gas machine. In the foreground a portion of the brick from the superheater is shown. The condition of the brick is better illustrated in Plate No. 7. The bricks are arranged in the direction of the travel of gas through the machine, starting at the left side of the Plate. The first was taken from the top course of brick in the carburettor, the second from the middle course, the third from the bottom course, the fourth from the bottom course in the superheater, the fifth from the middle course and the sixth from the top course. The fifth and sixth bricks have been in the gas machine twice, as the upper half of the superheater is always checkered with old brick. The first brick shows that some of the lighter fractions of the gas oil have been burned on the brick, which fact is noticeable only on the first and sometimes second course. This trouble is overcome in a large measure by delaying the admission of oil for a fraction of a minute after the steam has been turned on, thereby reducing the temperature of the upper courses so that the cold oil will not be over cracked, or in works' parlance, taking the "sharp heat" off the top courses. When the machine is shut down for repairs the brick immediately begin to cool and may easily be removed by a long handled hook or by hand when sufficiently cold, whereas it previously required 2 or 3 days to burn out the carbon, and 3 or 4 more to cool off the bricks which had become almost white hot by the intense combustion of this fine carbon.

With the carburettor and superheater checkerwork as free and open the day the gas machine was let down for repairs as it was the day it was started, it became necessary to determine in a general way by means of the pyrometer when the life of the brick was exhausted. When the brick are new there is only a slight drop in temperature in the bottom of the carburettor with the addition of a given quantity of oil, but as the brick become old the drop in temperature is greater for the same amount of oil used. The following table shows the loss in temperature as indicated by the pyrometer with its fire-ends placed in the middle of the carburettor or nine courses down from the top.

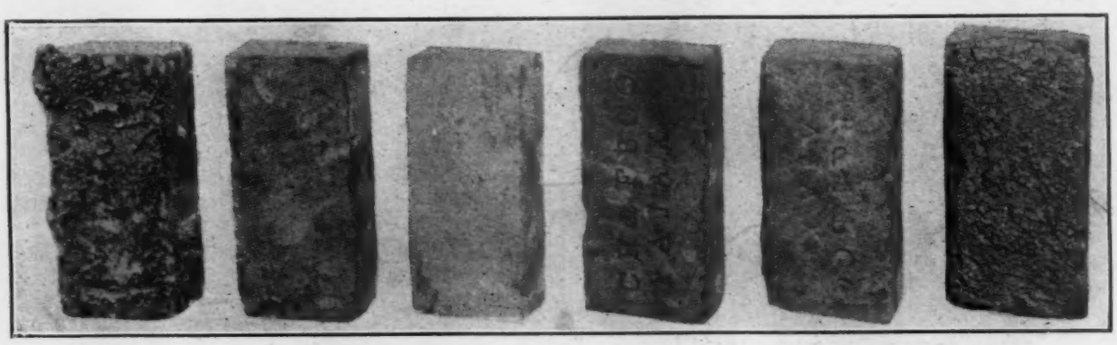
No. Machine.	Date when Rechecked.	Drop in Temperature—New Brick.	Drop in Temperature—Old Brick.
No. 7 Machine	June, 1909	150	300
No. 7 "	Oct., "	200	350
No. 8 "	Oct., "	250	500
No. 9 "	June, "	250	400
No. 9 "	Oct., "	125	325
No. 10 "	July, "	175	375
No. 10 "	Nov. "	200	325

This increased drop in temperature is due in a large measure to the fact that the heat stored in the brick is not as quickly conducted to the surface of the old brick as it is in the new, and, therefore, more heat is required from the courses farther through the machine to fix the oil vapors as gases when the brick are old. It will be noted in comparing the following table with the preceding that, although the drop in temperature of the brick is somewhat less in the bottom of the carburettor or 17 courses from the oil spray than it is 9 courses from the oil spray when the brick are old, yet the drop is very slight in the bottom course when the brick are new.

Temperatures 17 Courses from Top.

Machine, Type.	Date when Rechecked.	Drop in Temperature.—New Brick.	Old Brick.
No. 7	Oct., 1909	100	250
No. 8	Apr., 1909	75	275
No. 8	Oct., 1909	75	300
No. 9	June, 1909	100	200
No. 9	Jan., 1910	75	150

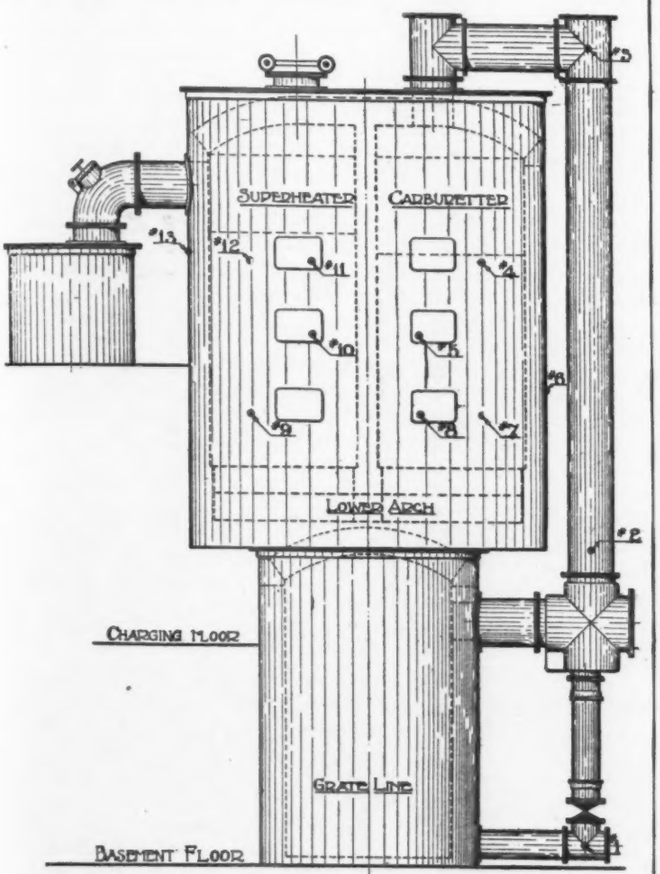
This increase drop in temperature upon the addition of the same quantity of oil per run is a fair indication that the machine needs new checkerbrick; as the gas works' foreman would say, the machine "won't hold her heats."



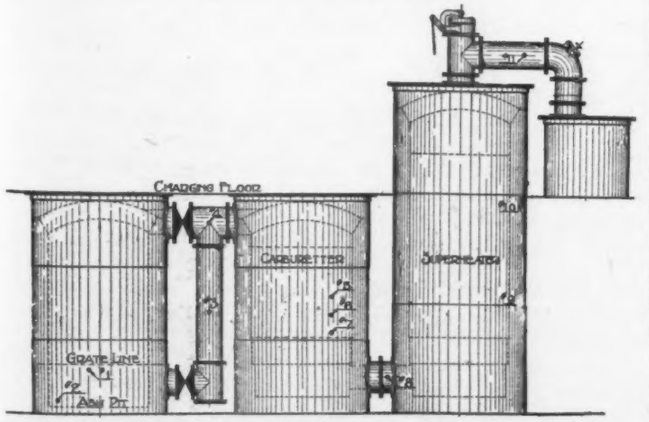
Top. Middle Carburetter. Bottom. Bottom. Middle Superheater. Top.

Plate VII.—*Checkerbrick from Gas Machine Using Pyrometers.*—Note the freedom of brick from lamp black. The top course in carburettor shows some burned oil, which is difficult to prevent on the top course; other bricks show a thin layer of reddish dust; the last two bricks have been used twice, as the upper half of the superheater is always rechecked with old brick. These brick have been taken from an 11-foot gas machine after 2,400 hours' use in actual gas making time.

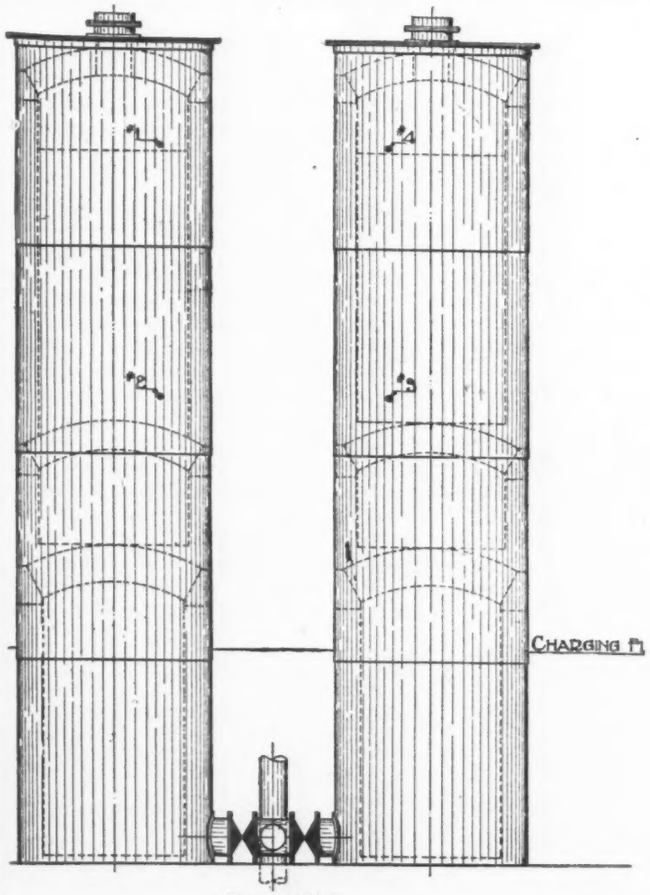
In order to obtain information regarding the distribution of heat through various types of gas machines and the variation in temperature at different points in the machine under operating conditions, I took simultaneous records of the temperatures at given points for 14 consecutive days, noting the changes in operation. The diagram of the three types of carburetted water gas machines gives a clear conception of the points at which these continuous records were taken. (See diagram of types 1, 2, 3.) The black areas with their corresponding numbers indicate the position of the fire-ends in each type, numbering from No. 1 on, in the direction of travel of gas through the machine.



TYPE Nº 1



TYPE Nº 2



TYPE Nº 3

In type of gas machine No. 1, records were taken of the temperatures of down-run gases at the base of the hydrogen pipe; of up and down-run gases and blast gases in the hydrogen pipe just above the "Williamson" water sealed hot valve; of the gases at the top of the hydrogen pipe; of the first course of brick in the carburettor; of the 12th course of brick in the carburettor near the center wall between the carburettor and the superheater; of the 20th course of brick at the farthest point from, and at right angles to the center wall; of the 23d course as shown in the diagram; of the 23d course near the center wall; of the 39th course of brick (39th from the oil spray or 8th from the bottom of the superheater); of the 50th course of brick; of the 61st course of brick near the center wall; of the 61st course away from the center wall; of the 62d course at right angles to the center wall (top of superheater).

In type of gas machine No. 2 records were taken of the temperatures of down-run gases in the generator 4 inches below the grate bars, in the ash pit, and in the hydrogen pipe as indicated in the diagram; of the temperature of up-run, down-run and blast gases at the top of the hydrogen pipe near the "Levy" valve; of the 9th course of brick from the oil spray in the carburettor; of the 13th course; of the 17th course; of the gases passing through the connection pipe between the carburettor and superheater; of the 19th course (or 1st course in superheater); of the 56th course (or top of superheater), and of the gas in the take-off pipe.

In type of gas machine No, 3 readings were taken from the top course and bottom course of brick in one shell and the bottom course and top course of the twin shell.

To discuss the results obtained at each of these points in detail would require more time than may well be taken in this meeting, but I shall be pleased to go more fully into the discussion of any results or conclusions in which you may be especially interested.

The average temperatures obtained by series of tests on type No. 1 water gas machine may be found in the following table. The first column in the table indicates the point at which the temperature was taken (see diagram, type No. 1); the second column indicates the number of courses of checker brick between each position of the fire-end and the oil spray; the third column indicates the maximum temperature at each point, *i. e.*, the temperature attained after blasting; the fourth indicates the minimum temperature, *i. e.*, at the end of the run; the fifth indicates the loss in temperature at each point upon making gas; and the sixth indicates the average temperature carried at each point.

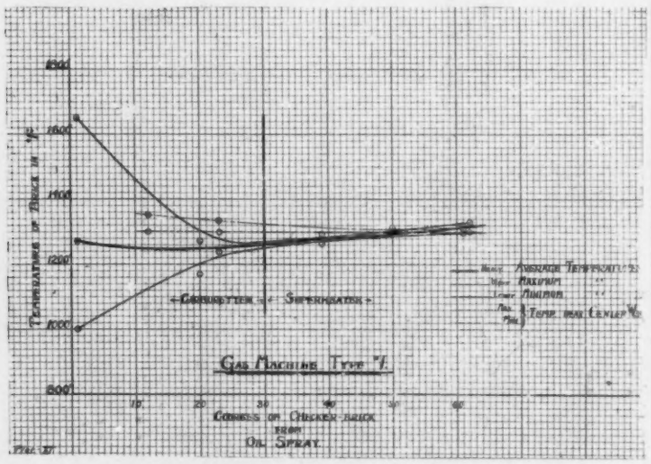
In this type of gas machine the carburettor and superheater are built side by side within a single shell, separated by a 14-inch center wall of brick extending from the lower arch up to the top of the

TABLE No. 1.

Test Point.	Course of Brick.	Max.	Min.	Drop.	Average.	Remarks.
1	.....				625	Center of 12-inch pipe.
					(1,610	End of blasting.
2	.....				(1,360	End of up-run.
					(720	End of down-run.
					(1,500	End of blasting.
3	.....				(1,220	End of up-run.
					(920	End of down-run.
4	1	1,650	1,000	650	1,270	
5	12	1,350	1,300	50	1,325	12 inches from wall.
6	20	1,270	1,170	100	1,220	
7	23	1,300	1.240	60	1,270	
8	23	1,335	1,300	35	1,320	12 inches from wall.
9	39	1,295	1.265	30	1,280	
10	50	1,310	1,300	10	1,305	12 inches from wall.
11	61	1,320	1.320	0	1,320	12 inches from wall.
12	61	1,310	1,290	20	1,300	
13	62	1,330	1,300	30	1,315	

machine. There are about 31 courses of brick in the carburettor and 35 in the superheater. It will be noted from the above table that the temperatures are quite uniform on both sides of this wall as shown by tests taken at points 5, 8, 10 and 11, and also that the drop in temperature during the run is very small at all these points. Evidently this wall acts as a reservoir of heat tending to maintain more uniform temperatures throughout the fixing chambers.

The first few courses of brick performed the "heavy duty" of vaporizing and cracking the oils as is strikingly indicated by the plotted curve (see Plate 11). The coaling effect of the oil on the first course



is very marked, being about 650° F., while the drop in temperature at the 23d course (point 7) in the same relative position as that taken at the first course (point 4) is only 60° F.

(To be Continued.)

Installation Gas Arcs and Consumption Results.

[Prepared for the Third Annual Convention of the Pennsylvania Gas Association, by J. VANDER BOUT, Williamsport, Pa.]

In any community there are to be found people who have never enjoyed the comfort and pleasure resulting from modern gas lighting installations, and who are not aware of the superiority of gas in comparison with other illuminants. These people are inclined to estimate the value and importance of gas as an illuminant, according to the number of lamps they see in service, their appearance and the quantity and quality of light they produce, especially in the commercial section of their home towns or cities. This is only one of the reasons why it seems advisable for gas companies to ever increase their efforts to improve and retain their commercial lighting, continually endeavoring to secure a larger representation in this field. Experience in general has shown that arc lamps in their various sizes are best suited to meet commercial requirements. The reasons for this are so many and generally conceded that I do not consider it worth while to dwell on these facts in detail.

In regard to the terms on which arc lamps are installed by the gas companies, I have been told that "It makes no difference what they are, for you can sell just as many at $20 each, as you can at $10. The very fact that you are asking a high price will help to convince a merchant or manufacturer that it is a very fine and desirable lamp." This does not appear to be very sound logic, however, as you have to demonstrate to the satisfaction of the merchant that arc lamps will improve the lighting and appearance of his place of business, at no greater, or a lower, cost than the equipment he is using, before he will even be interested in the price of the lamp you have to offer. It is a perfectly natural law that price and terms effect every sale.

Local conditions must be considered, and should govern, to a great extent, the price and terms on which arc lamps are installed. We install arc lamps gratis, where no piping is required, the company, of course, retaining ownership of the lamps. The price of gas for illuminating is $1.40, net. The two competing electric companies supply current at 2, 3, 4 and 5 cents per kw., in some cases installing wiring, lamps and tungsten renewals, gratis. Under these conditions I feel that we would install a smaller number of arcs were we to charge $10 or $20 each for them. The result years ago of selling lamps to the consumer, has convinced us that the only positive way to keep the lamps always in working order is to own them; for, even though you have a contract covering maintenance of a lamp belonging to the consumer, he is apt to cancel it as soon as he gets the idea that he or someone else can do it cheaper for him, but if you retain ownership of the lamps, and loan or rent them with maintenance included, this will not happen. There seems to be no good reason for the belief that a merchant is more apt to remain a customer if he owns the lamps.

A good solicitor, "The right man in the right place," is able to obtain considerable new arc lamp business, and it is very important that you have the right kind of a solicitor for the position. Of still greater importance, however, is the maintenance department, and unless the men in this department appreciate the importance of keeping the lamps in perfect working condition at all times, the solicitor's work will be of little benefit in the end. The lamps should be kept in as good condition as they were the first week they were installed; from top to bottom and all inside, the valves, mixing chambers, screens, tips, mantles, pilots, glassware and stack should receive attention continually. These are not trifles; they are the life of the lamp. Some one said, "Trifles make perfection," but "Perfection is no trifle."

Without exception I believe good quality of maintenance the most important factor in holding and increasing commercial lighting. Protecting this business is much easier than regaining it. By this, I do not wish to convey an impression that I believe all that is necessary to obtain new arc lamp business is to supply a good lamp perfectly maintained, then sit back and wait for orders to roll in. Emerson once said, "If a man can preach a better sermon, write a better book, or make a better mouse trap than his neighbor, even though he built his house in the woods, the world will make a beaten path to his door." That was in the days of little advertising. If we want big results, we cannot afford to wait for the business to come to us; we must go after it. Even though our lamp is far superior to our neighbor's, we have to show the merchants, prove it to them, and keep everlastingly doing so—not for a month or two in the fall of the year, but from the beginning of January to the last of December, year after year.

It is perhaps needless to emphasize the importance of stating the correct consumption and cost per hour of lamps, when comparing costs. The solicitor should be thoroughly posted as to the candle power and operating cost per hour of the various gas and electric lamps. He must be able to so thoroughly explain the many advantages of gas lighting, from the standpoints of economy, quality or light, hygienic value, appearance, color value, convenience, safety, reliability, steadiness of light, and many others, in such a way that he is able to overcome any objections to the use of gas which may be raised.

When an order to install arc lamps is obtained from a merchant, it is a good plan to arrange for the lamps to be installed at a specific time, the merchant to set the time, of course, and in this way avoid annoyance which might be caused, should you endeavor to hang the lamps on his busy day, or for any other reason which might cause him to postpone the installation and perhaps change his mind entirely and cancel the order.

In large cities the illuminating engineer employed by the gas company lays out the lighting plans of all installations, while in the smaller cities it is the solicitor who applies his science of illumination to the laying out of plans to satisfactorily and economically meet the requirements of the existing conditions.

A booklet issued by one of the leading arc lamp manufacturing companies, the title of which is "Light Facts," will be found

a great help when planning installations, and when the costs of operation and foot candles are to be determined in advance. In order to replace electric lamps, it is often necessary to install a number of arcs in order to demonstrate the superiority of gas illumination. The additional business to be obtained in this way will warrant the expense involved.

When replacing electric lamps, with gas arcs, it is advisable that the electric equipments be removed. This should be suggested, as they are no longer required, gas being perfectly reliable at all times. The place of business will have a much better appearance without them, and in case the merchant is a man who finds it difficult to remain of the same opinion for any length of time, your suggestion may relieve him of his difficulty.

When installing arc lamps in a nicely finished and decorated room, it is often out of the question to hang the arcs on common black pipe. Casing and canopy to match the finish of the lamp should be used. A much neater and more finished appearance will result. A nicely nickeled or enameled lamp attached to ordinary gas pipe, with ugly appearing electric connections left in plain view at the ceiling, will result in anything but a neat appearing and well finished installation.

The indoor and outdoor arc lamps now on the market have "cracked open" an entirely new field for commercial lighting. The exhibitions at the recent gas shows have demonstrated that the field is unlimited, and if the electric companies have a commercial lamp that can in any way compare, either in appearance, quantity or quality of illumination with this beautiful, perfect, white ball of light, I have not had the pleasure of seeing it.

In soliciting outdoor lamp business, we found that, by soliciting the merchants in one block or section, and getting them to work together for outside display lighting, more interest was aroused than by soliciting them individually. This is not surprising, neither is it a new idea, but I mention it on account of the amount of business which it seemed we were unable to obtain in any other way.

Practically all of our outdoor lighting business is contracted for, on a fixed price per year basis, paid in equal monthly portions. Our experience has been, that lamps connected to the consumers' meters were seldom used to any great extent. The majority of the lamps would be turned out when the stores closed in the evening, and during the summer months would be lighted Saturday nights only. For this reason, we aimed to install all outside lamps in the commercial section of the city, on this flat rate basis, our employee lighting the lamps at dusk and extinguishing them at 11 o'clock.

Another point in favor of installing outside lamps on this plan is the reduction in installation cost, as a number of lamps can be connected to one header and one meter, providing, of course, you are lighting a block, where you have one or more lamps to install at each store front and obtain permission from owners of buildings to run the piping in this way.

Great care should be exercised when installing outside lamps in regard to locations, as it is at times very difficult to hang lamps at equal heights and distances from buildings on account of electric and other signs and different heights of store fronts. However, if the conditions are studied carefully, good results are generally obtained.

When installing lamps in a block on the above plan, we found it best to install all piping and drops before hanging the lamps, so that the first lighting of all lamps would take place on the same evening. The merchants are better satisfied this way, and, by advising the newspaper men when this would take place, considerable interest was added to the affair, the papers through their columns helping to boost the "White Way."

The feed lines for these lamps are fastened to the building, the drops extending 5 to 6 feet over the walk, and supported by an extra arm, either from above or below, the lamps being hung high enough to clear all awnings. These lines and drops are painted the same color as the building.

The lamps, when placed in rows as in the plan mentioned above, were not installed primarily to light window displays, although they do combine a most brilliant curb lighting and window lighting. For window lighting, where outdoor arcs are used, we have placed the lamps nearer to the building, giving very satisfactory results.

Outdoor lighting by gas has increased many hundred-fold during the past year; and this is only the beginning. There is a growing desire all over the country for more and better outside illumination. Like the electric sign business, it only needed a start, and I believe that, during the next few years, outside illumination by gas will show a greater growth in the commercial sections, than will the electric sign business and outside illumination by electricity combined, excepting where the lighting companies are non competitive.

Consumption Results.—When replacing single burner lamps with arcs, the consumption is effected in various degrees, the increase ranging anywhere from 10 to 100 per cent., according to the style of burners formerly used, the customer, however, generally being satisfied in this respect, and appreciating the improved illumination. In such installations arc light business can only be credited with the increased consumption over and above the original consumption without arcs. Installations replacing electricity or other forms of lighting produce 100 per cent. increased consumption. In this 100 per cent. class I would also include all cases where competition has been overcome by the use of the arc. To satisfy ourselves that this is a large item, we have only to consider how little of the store lighting we could retain if all the arcs were removed and merchants left to use and care for single lights of their selection.

I am including a list showing the average consumption per lamp, per year, according to the class of business. These figures are the average of the figures obtained from different cities, varying in population from 30,000 to 1,000,000 and are convincing evidence of the fact that arc lighting has proven very satisfactory to the customer, as well as to the gas companies and should be pushed to the limit.

Business.	Average Cons. per Lamp, per Year, Cubic Feet.
Automobiles	29,090
Bakers	54,243
Boilershops	30,388
Book stores	23,637
Bowling and pool rooms	26,687
Candy stores	33,793
Cigar stores	27,304
Cleaners and dyers	34,115
Clothing stores.	24,234
Commission houses	57,453
Delicatessen	48,652
Department stores	16,684
Drug stores	40,622
Dry goods	20,852
Factories	26,060
Fineries	90,260
Florists	28,960
Fruits	27,719
Furniture	24,689
Gents furnishings	17,018
Groceries	24,147
Hardware	23,291
House furnishers	22,658
Jewelry	20,240
Laundries	55,332
Milliners	20,886
Offices	30,607
Paint stores	31,533
Pawn shops	24,485
Printers	35,436
Restaurants	40,261
Saloons	33,760
Shoes	23,773
Tea and coffee	21,672
Wholesalers	37,330
Miscellaneous	25,428
Total	1,153,299
Final average yearly consumption per lamp	32,036

The Lloyd Proportioning Mixer.

This device resulted primarily through the application by Mr. E. F. Lloyd, of Detroit, Mich., of an invention by Mr. Frank L. Cross, which was developed originally by Mr. Cross to meet certain industrial phases in connection with the industrial business of a large gas company. The function thereof is to cause the admixture of a constant proportion of air with the gas employed in heating furnaces, melting pots, enamelling ovens, or other special service, in which the air for combustion is supplied under pressure.

Gas and air being separately connected to the respective inlets of the mixer, one outlet is connected directly to the burner, and the proper adjustment is easily made by anyone capable of judging air flame, whereafter no further change is necessary to be made in the apparatus. The volume of gas supplied to the burner is controlled through manipulation of the gas cock in the supply line in the usual manner. The air supply is always wide open, the mixer automatically controlling the supply of air to the adjustable proportion. As the air pressure may vary widely without any effect whatever on the mixture in the burner, the supply may be taken from any existing

air pressure equipment or other convenient, available source. The automatic range of the proportioning mixture from high to low ex-

ceeds the range of any gas burners in use ordinarily. That is to say, the gas may be turned down to the lowest point at which the burner itself can support flame, or turned up to its maximum capacity without causing change in the perfect proportions of the mixture. This mixer will readily pay for itself in a few months' use in connection with enamelling ovens, furnaces of various sorts, melting pots, candy bakers, bake ovens, tire heaters, dryers or any other form of furnace using gas with air pressure. The chief claims on economical account are:

1. By automatically regulating the air exactly to the right proportion for gas on all volumes of flame; thus: (a) Always preventing waste of heat through excess air; (b) always preventing smoking of products through excess gas.

2. By saving time ordinarily required to readjust air in changes of gas.

3. By eliminating the continual watching necessary when air pressures vary.

4. By using air under lower pressure than needed with other mixing devices.

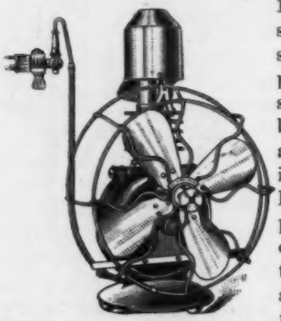
The illustrations clearly show the plan of construction and the method of operation as well.

Management & Commercial Methods.

TIPS FROM FITTING TO COMMERCIAL DEPARTMENT.

THE THERMAL-MOTOR COMPANY'S FAN.—The portable thermal fan, manufactured by the Thermal Motor Company, Philadelphia, Pa., represents quite a new and radical departure in gas fan construction. Realizing that the type of fan best adapted to general use should be a high speed machine, and that it was also desirable to conform as nearly as possible to the outlines of the electric fan, the Company placed this device on the market feeling that the requirements were satisfactorily met and overcome by the inventor.

The 12-inch fan stands only 19 inches high, weighs 24 pounds complete, consumes about 3 feet of gas at top speed (between 1,400 to 1,500 revolutions per minute) and is silent in its operation. The odor occasionally complained of in most gas appliances is entirely eliminated by a construction which makes incomplete combustion impossible, and moving parts are inclosed in a dust proof case, leaving nothing to get out of order or rattle loose from rough handling. The Company calls special attention to what it considers the most important feature of the "Thermal Fan." Namely, its speed, and believes that its great success with this machine is due to that feature more than to any other. The chief difficulty in former attempts to accomplish this result was that, in order to obtain power to allow a sufficient high speed gear to produce a rapid motion, a very large cylinder (3 to 4 inches in diameter) was necessary. This increased the gas consumption to 6, even to 8 feet per hour, besides causing the machine to be so cumbersome that it was hardly within the portable class. The inventor accomplishes the high speed necessary with a 2-inch cylinder, bringing the total weight to a low figure, and reduces the consumption of gas to 3 feet per hour. The inventor of the thermal fan, who is an engineer of note, connected with the United Gas Improvement Company, is in a position to realize the requirements along this line. He has solved the problem from the point of view of a gas expert.



Recent Patent Issues.

Prepared for the AMERICAN GAS LIGHT JOURNAL by ROYAL E. BURNHAM, solicitor of patents and counselor in patent causes, 833 Bond Building, Washington, D. C., from whom illustrations and specifications of any patent mentioned below may be obtained for 10 cents.

990,239. Gas Stove. C. L. Dickerman and W. Newman, Ardmore, Okla.

990,268. Gas Heater. C. Hohman, Newark, N. J.

990,713. Process for the Regulation of the Temperature of the Fuel Bed in Gas Producing Apparatus. H. L. Doherty, New York city.

990,714. Gas Producing and Consuming Apparatus. H. L. Doherty, New York city.

990,753. Incandescent Mantle. R. Langhans, Berlin, Germany.

991,082. Gas Producer. H. C. Perdue, Hobart, Ind.

991,141. Gas Burner. C. W. DeForest, Covington, Ky., assignor of one-half to the Creaghead Engineering Company, Cincinnati, O.

991,157. Process of Washing Gases for Rapidly Freeing them from Dust or Smoke Held in Suspension Therein. P. Kestner, Lille, France.

991,180. Gas Pressure Regulator. G. M. S. Tait, Montclair, N. J., assignor to Tait Producer Company, New York, N. Y.

991,216. Safety Attachment for Gas Stoves. A. G. Lawrence, Catonsville, Md.

991,225. Stuffing Box for Gas Meters. A. B. Morton, Wakefield, Mass.

991,272. Combined Gas and Solid Fuel Burning Stove. E. R. Cahoone, Troy, N. Y.

991,408. Gas Heater. W. Akin, Los Angeles, Cal.

Items of Interest

FROM VARIOUS LOCALITIES.

MR. C. C. WILLIAMS, formerly with the Rochester (N. Y.) Railway and Light Company, and later on with the Estate Stove Company has accepted the position of representative of and for the General Gas Light Company in Pennsylvania and adjacent territory.

THE Gas Machinery Company, of Cleveland, O., has been awarded a contract for 3 new cast iron purifiers, complete, with connections, oxide elevators and miscellaneous machinery to be erected in the gas works at Lockport, N. Y. The vessels will be fitted with dry seal covers, cast iron operating floor, and connections arranged for future extensions.

SECRETARY SCHULZ, of the Industrial Instrument Company, Foxboro, Mass., has forwarded us "Bulletins Nos. 41 and 42." The first has to do with thermometers and thermographes, the other concerns recording gauges. They are gotten up in the usual clever style that mark all the publications of this Company.

THE Tenney outfit, of Des Moines, Ia., has, we are informed, resumed work on the construction of the plant at Belle Plaine, Ia. The Manager of the Belle Plaine Company is Mr. John A. Myers, now of Omaha, Neb., and theretofore in charge of the works at Galva, Ills.

THE selling rate at Auburn, Ind., has been revised, the Company having announced that, commencing the 1st prox., the rate will be $1.20 instead of $1.30.

MR. FRANK E. HOLLIS has been delegated to go on the road for the National Gas Light Company, with no district restrictions.

THE Antigo (Wis.) Gas Company reports a large increase in the number of consumers hooked up, no fewer than 10 having been put in line in April. The sales of gas appliances are keeping pace too with the general development of its trading. A particular phase or illustration of the spread of gas for purposes other than lighting is evidenced in the complete fitting up of the "classiest" restaurant in the place, "The Arnold," for cooking by gas.

ON the 2d inst., Messrs. Townsend, Elliott and Townsend, through Solicitor R. R. Van Horn, made application to the Governor of Pennsylvania for the right to permit the Gas Company, of Delaware County, to manufacture and supply gas for light only in the Penn-

sylvania boroughs of Aldan, Prospect Park, Upland, Marcus Hook, Swarthmore, Rutledge, Martin and Milburn.

THE Mahanoy City (Pa.) Gas Company's franchises and properties will be sold at noon of the 2d prox., in the Pottsville court house.

A RECENT issue of the Rochester (N. Y.) *Post-Express* says that Mr. J. P. MacSweeney, Asst. Com. Agent, Mr. Frank Hellen, Supt. of gas distribution, and Mr. B. B. Yeomans, industrial fuel expert of the Rochester Railway and Light Company, started on a Western trip a few days ago to determine to what extent gas is being used in the industrial field in other cities. A main thing in the itinerary will be the study of methods in use in the transportation departments of various companies. The schedule of their visit listed the cities of Chicago, Detroit, Milwaukee and Rockford.

THE Standard Gas and Electric Company, of Raleigh, N. C., has been purchased by the Carolina Power and Light Company. Captain Samuel E. Linton will likely continue to act as General Manager of the Gas Company.

PROVO, CAL., is to have a gas plant, and Jno. Kempf, Jr., of Oakland, is interested therein.

THE latest "Special Bulletin" of the Western Gas Construction Company is dated May, and has to do with its excellent valves, standard fittings and flanges. The table of dimensions of standard fittings, which is nicely illustrated, is especially a time saver, and quite equal to it is the listing of pipe specials, a fine and varied assortment can be shipped from the Fort Wayne plant on demand. Another well-put story is contained in the handsome illustration of the Western Company's inner seal tube design of P. & A. tar extractor. Like everything else that comes out of its shops and presses, the get-up of the "Bulletin" is irreproachable.

THE Gas Machinery Company, of Cleveland, O., has been awarded the contract for an additional inclined bench of 6's, and the resetting of 2 benches of like type, in the Mobile (Ala.) works. These retorts and settings are to be entirely of silica, which the erectors declare possesses greater conductivity and refractoriness, besides being vastly stronger than the average clay material mixture. The Machinery folks are also under contract to furnish bench work in the plants at Franklin, Ind.; Bellingham, Wash., and Ogden, Utah.

MESSRS. CHARLES E. STARR, formerly of the Philadelphia Public Utilities Company, and John Reed, who was connected with the earlier management of the Atlantic City (N. J.) Gas Company, have returned from the South, bringing with them the much-sought after franchise for the operation of a gas plant in Key West, Fla. The geographical location of this far-famed Southern city, located as it is on the water route from the Panama Canal, and being the Southern terminal of the Flagler Railroad system, connected by steam vessel with Cuba, and from the further fact that Key West shares with Tampa the fame of being one of the great cigar manufacturing centers of the world, made the construction of a gas plant an important operation. The city is growing rapidly and the new venture should be a money maker from the start.

PIPE extensions so far arranged and plotted by Manager Searles and his men provide for the placing of 8 miles or so this season. Then they say the indefatigable Sir Robert is suppressing the gas end of the Company's business. Not so that one would notice it, eh!

THE proprietors of the Brockton (Mass.) Gas Company have petitioned the Selectmen of the village of Randolph for permission to pipe the streets thereof. There is little reason for presuming that other than a favorable answer will be given.

MR. J. J. KNIGHT, of Kalamazoo, Mich., whose indentification with the gas world is such that he needs no introduction of a formal sort, to make him acquainted with any of the fraternity, is interested in the project to construct a gas plant for the bettering of the state of the residents of Billings, Mont. This, live-wire settlement is the center of a mining activity, that has long to live; and "J. J. K." is just the man to help the good cause along.

AT the annual meeting of the Cincinnati (O.) Gas and Electric Company the former Board of Directors was re-elected. President Hauck in his annual message to the shareholders, having congratulated the proprietors on a very successful business for the year, put a quietus on certain malcontents by remarking that, "The 3 million dollars secured through the absorption of the Company by the Union Gas and Electric Company had been invested in 1909 in the bonds of the Columbia Gas and Electric Company."

MR. JOSEPH JEFFREY, Secretary of the Scranton (Pa.) Gas and Water Company, was elected at the recent meeting of the shareholders to succeed the late Mr. James Archibald. The complete organization of the Company is: Directors, W. W. Scranton, Worthington Scranton, Joseph Jeffrey, Geo. E. Smith and E. P. Kingsbury; President, W. W. Scranton; Vice-President, Worthington Scranton; Secretary and Treasurer, Joseph Jeffery; Superintendent, E. M. Stack.

ATTORNEY J. T. HART, of Cleveland, O., has been appointed receiver of the Oberlin (O.) Gas and Electric Company. The foreclosure proceedings was instituted at the instigation of the Westinghouse Company.

THE new rate at Kenosha ($1.10, gross, $1 net to ordinary consumers) became effective the first inst. Those who use 20,000 feet per month are to get their supply at 80 cents per 1,000, and those who use in excess of 30,000 in 30 days are to pay 60 cents per 1,000. Hereafter single meters will only be maintained.

THE Consolidated Gas Company, of Red Bank, N. J., has piped the streets of the outlying live settlement of Fair Haven, N. J.

AT a special election of the voters of Buchanan, Mich., held for the purpose of determining whether or not a franchise be granted the Niles Gas Light Company for extending the system to and through the first named place, the project was largely assented to.

THE Public Service Commissioner for the district has authorized the South Shore (N. Y.) Company to increase its capital stock to $100,000 from the present bulk of $50,000. It is stipulated that it shall be sold at not less than par, and the proceeds are to be used in extending the Company's main system to and through Lindenhurst, Copiague, Amityville and Farmingdale.

WE always knew that Mr. H. B. Hoyt, General Manager of the Jacksonville (Fla.) Gas Company, was a most persuasive sort of gentleman, but his past in respect of that useful and estimable quality is small indeed when compared with his present possession thereof. We are led to this belief from the following matter which was prominently placed in the colums of the Jacksonville *Metropolis*, dated the 3d inst.: "Many people in thinking of our Gas Company think of it only as an inanimate corporation, a thing which they cannot see and cannot feel, yet they know it exists. They do not stop to realize that this corporation is made up of live business men, men of high commercial standing and ability, men who have the interests of the whole community at heart, and who are working both night and day for the upbuilding of Jacksonville, They do not seem to realize that these men are engaged in a business of serving the public, of supplying you and thousands of people just like you all over the city, with one of the greatest necessities of modern life. It is the close application to duty, the constant vigilance of these men, which is responsible for an interrupted gas service, and which makes it possible for the housewife to cook her meals in comfort, the tailor to press his clothes, for the tinner to heat his irons, and the manufacturer to increase his output at reduced cost."

THE Milton (Pa.) Gas Company has chosen the following Board of Directors: T. C. Heinen, R. W. Wilson, Geo. D. Skinner, W. W. Wilson, Sidney Davis, W. A. Heinen and G. B. Hedenberg.

THE Watkins (N. Y.) Illuminating and Power Company has suspended business. The Company was organized in 1869, and commenced business in May, 1870. It never was a very vigorous concern and managed to survive the inroads of the current suppliers, but the gradual though sure encroachment of natural gas finally put an end to it. The late lamented "Fred." Davis, of Waltham, Mass., was one of its original promotors.

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS.

THOS. J. CUNNINGHAM,
ELBERT P. CALLENDER,
EDITORS.

CHARLES H. WADELTON,
MANAGER.

MONDAY, MAY 15, 1911.

The Market for Gas Securities.

Trading in Consolidated is remarkably small, not over 1,000 shares having changed hands in the week. Up to noon to-day (Friday) no transactions were recorded. The closing price yesterday (Thursday) was 144¾ to 144½. However, the tone of shares is firmer than any notes emitted on the Exchange respecting it for weeks back. Almost needless it is to say that its business grows wonderfully well.

Brooklyn Union is acting in queer style of late, and one of the best specialists in this line on the Exchange said to the writer yesterday: "I'm reasonably certain that a move is about to be made in 'B. U. G.' that will put it up 25 points or more." The physical condition of the Company has been and is being improved by large expenditures out of earnings, and the time is likely close at hand when the P. S. C. will be asked to permit some sort of share return to holders in the near future. The capital stock of the Company has really not been increased since the merging was done, although its total trading must have increased 60 per cent. between then and now, and such increase necessarily had to be provided for out of monies that, by every rule of trade, should be represented in capital account. Peoples, of Chicago, shows no particular change, which rather goes to prove there is quite something of the nature in the Harrison attack resembling certain colored oils that figure largely in that product from the Middle-West States. Laclede's dividends (1¾ and 2½ per cent., respectively) were declared the 11th inst.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

115 BROADWAY, NEW YORK CITY.

MAY 15.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked*
Consolidated Gas Co.	$78,177,000	100	144¼	144⅝
Central Union Gas Co.—1st 5's, due 1972, J. & J.	3,000,000	1,000	103	105
Equitable Gas Light Co.—Con. 5's, due 1932, M. & S.	1,000,000	1,000	115	118
Mutual Gas Co.	3,500,000	100	155	165
New Amsterdam Gas Co.—1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	100	101½
New York & Richmond Gas Co. (Staten Island)	1,500,000	100	35	50
1st Mtg. Gold Bds. 5 p. ct.	1,000,000	—	98½	100½
New York and East River—1st 5's, due 1944, J. & J.	3,500,000	1,000	103	105
Con. 5's, due 1945, J. & J.	1,500,000	—	95	100
Northern Union—1st 5's, due 1927, J. & J.	1,250,000	1,000	94	100
Standard	5,000,000	100	50	70
Preferred	5,000,000	100	70	100
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	103	105
The Brooklyn Union	15,000,000	1,000	141½	142
1st Con. 5's, due 1948, M. & N.	15,000,000	—	106¾	107
Yonkers	299,550	500	130	—
Out-of-Town Companies.				
Bay State	50,000,000	50	⅛	⅜
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	—
" 1st Mtg. 5's	500,000	1,000	95	100
Boston United Gas Co.—1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
Bonds, 5's	5,250,000	1,000	59	60
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed Gold Bonds	7,660,000	1,000	104	105¼
Cincinnati Gas and Electric Co.	29,500,000	100	92	93
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	96	98
Columbus (O.) Gas Lt. & Heating Co.	1,682,750	100	90½	91
Preferred	3,026,500	100	75½	80
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	11,000,000	100	108½	—
Mortgages, 6's	3,600,000		89	100
Chesapeake, 1st 6's	1,000,000	—	—	—
Equitable, 1st 6's	910,000	—	—	—
Consolidated, 1st 5's	1,490,000	—	—	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	—
Con. Mtg. 5's	978,000	1,000	92	95
Bonds	75,000	—	—	100
Denver Gas and Electric	3,500,000	—	102	105
Detroit City Gas Co.	6,580,000	—	—	50
" Prior Lien 5's	5,619,000	1,000	97	100½
Detroit Gas Co., 5's	381,000	1,000	75	80
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	39	40
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co., 1st Mtg. 5's	1,350,000	1,000	100	101
Hartford	750,000	25	190	200
Hudson County Gas Co., of New Jersey	10,500,000	—	112	113½
" Bonds, 5's	10,500,000	—	108	108½
Indianapolis	2,000,000	—	78	83
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	50	82	—
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co., of Missouri	5,000,000	100	—	96
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede Gas Co., St. Louis.	10,000,000	100	103	105¼
Preferred	2,500,000	100	94¾	102
Bonds	10,000,000	1,000	102½	103
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	143	145
Madison Gas and Electric Co. 1st Mtg. 6's	400,000	1,000	106	108½
Massachusetts Gas Companies, of Boston	25,000,000	100	88	88½
Preferred	25,000,000	100	91	91¼
Montreal Gas Co., Canada	2,000,000	100	218	218¾
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	56	58
Bonds, 6's	6,000,000	—	137	138
New Haven Gas Co.	2,000,000	25	200	—
Peoples Gas Lt. & Coke Co., Chicago	25,000,000	100	104¾	105¼
1st Mortgage	20,100,000	1,000	—	—
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104⅜	105⅛
San Francisco Gas Co., Cal.	15,500,000	—	—	—
St. Joseph Gas Co.—1st Mtg. 5's	1,000,000	1,000	100	102
St. Paul Gas Light Co.	2,500,000	100	—	—
1st Mortgages, 6's	650,000	1,000	104	106
Extension, 6's	600,000	1,000	112¾	115
General Mortgage, 5's	3,447,000	1,000	97	98
Syracuse Gas Co., N. Y.	1,975,000	100	50	55
Bonds	2,047,000	1,000	101	103
Washington (D. C.) Gas Co.	1,800,000	200	410	412½
1st Mortgage, 6's	600,000	—	—	—
Western Gas Co., Milwaukee	4,000,000	—	—	—
Wilmington (Del.) Gas Co.	600,000	50	361	—

MEETING TIMES OF THE VARIOUS GAS ASSOCIATIONS.

American Gas Institute.—Annual meeting, October 18, 19, 20, 21, 1911. St. Louis, Mo. Officers: President, Donald McDonald, Louisville, Ky. Secretary, A. B. Beadle, 29 West 39th st., N. Y. City.

Canadian Gas Association.—Annual meeting, June, 13, 1911. Quebec, Ont. Officers President, Arthur Hewitt, Toronto, Ont.; Secretary and Treasurer, John Keilior, Hamilton, Ont.

Empire State Gas and Electric Association.—Annual meeting, Nov., 1911. New York City. Officers: President, C. R. Huntley, Buffalo, N. Y.; Secretary, C. H. B. Chapin, 29 W. 39th street. New York City.

Guild of Gas Managers of New England.—Annual meeting, March. Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, Walter G. Africa, Manchester, N. H.; Secretary, H. K. Morrison, Brockton, Mass.

Illinois Gas Association.—Annual meeting, time, March, Chicago, Ills. Officers: President, C. B. Strohn, Elgin, Ills.; Secretary-Treasurer, H. E. Newberry, Dixon, Ills.

Illuminating Engineering Society.—Annual meeting, Oct.. Chicago, Ill., 1911. Meetings of Sections, monthly. Pres't, A. E. Kennelly, Boston, Mass.; Secretary, Preston S. Millar, 29 W. 39th street, N. Y. City. Sections: New York: Secretary, Albert J. Marshall, 36 West 39th street. New England, Secretary, W. S. Farrow, 1230 Massachusetts avenue, Cambridge, Mass. Philadelphia, Secretary, G. B. Muth, 1000 Chestnut street Chicago, Secretary, F. H. Bernhard, Marquette Building.

Indiana Gas Association.—Annual meeting, Jan. 17 and 18, 1912, Indianapolis. Officers: President, S. E. Mulholland, Fort Wayne; Vice-President, Howard L. Olds, Indianapolis; Secretary-Treasurer, Philmer Eves, Indianapolis.

Iowa District Gas Association.—Annual meeting, time, May, 24, 25, 26, 1911; Clinton, Ia, Officers: President, Austin Burt, Waterloo, Ia.; Secretary and Treasurer, G. I. Vincent, Des Moines, Ia.

Kansas Gas, Water and Electric Light Association.—Annual meeting, time, ——— Wichita, Kas. Officers: President, W. A. Scothorn, Hutchinson, Kas.; Secretary and Treasurer, J. D. Nicholson, Newton, Kas.

Michigan Gas Association—Annual meeting, time, Sept. 20, 21, 22, 1911; Detroit, Mich. Officers: President, A. P. Ewing, Detroit, Mich.; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

Missouri Electric Light, Gas, Water Works and Street Railway Association.—Annual meeting, April, 1912; St. Louis, Mo. Officers: President, F. E. Murray, Louisiana, Mo.; Secretary and Treasurer, N. J. Cunningham, Springfield, Mo.

National Commercial Gas Association.—Annual meeting, October 23-28, 1911. Denver, Officers: President, C. N. Stannard, Denver; Secretary, Louis Stotz, 29 West 39th street, New York City.

Natural Gas Association.—Annual meeting, May 16, 17 and 18, 1911; Pittsburgh, Pa. Officers: President, John M. Garard, Columbus, O. Secretary, T. C. Jones, Delaware, O. Editor Wrinkle Department, F. W. Stone, Ashtabula, O.

New England Gas Association.—Annual meeting, third Wednesday in February, 1911; Boston. Officers: President, J. A. Coffin, Gloucester, Mass.; Secretary-Treasurer, N.W. Gifford, East Boston, Mass.

Ohio Gas Association —President, John M. Garard, Columbus, O.; Secretary-Treasurer T. C. Jones, Delaware, O.

Oklahoma Public Utilities Association.—Annual meeting, May 9, 10 and 11, 1911. Officers: President, E. C. Reynolds; Secretary, Galen Crow, Guthrie, Okla.

Pacific Coast Gas Association.—Annual meeting, Sept. 20, 21 and 22, 1911, Oakland, Cal. Officers: President, F. A. Leach, Jr., Oakland, Cal.; Vice President, W. Baurhyte, Los Angeles, Cal.; Secretary-Treasurer, John A. Britton, 445 Sutter street, San Francisco, Cal.

Pennsylvania Gas Association.—Annual meeting, April, 1912, Williamsport, Pa. Officers President, C. W. Butterworth, Millon, Pa; Secretary-Treasurer, William H. Merritt. Lebanon, Pa.

Society of Gas Lighting.—Annual meeting, December, 1911; monthly meeting, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary, George G. Ramsdell, 254 West 88th street, New York city.

Southern Gas Association.—Annual meeting, April, 1912, Jacksonville, Fla. Officers: President, H. B. Hoyt, Jacksonville, Fla.; Secretary-Treasurer, E. D. Brewer, Atlanta, Ga.

Southwestern Electrical and Gas Association.—Annual meeting. April 27, 28, 29, 1911; Houston, Tex. Officers: President, W. B. Tuttle, San Antonio, Tex.; Secretary, D. G. Fisher, Dallas, Tex.

Wisconsin Gas Association.—Annual meeting, May 17 and 18, 1911, Milwaukee, Wis. Officers: President, W. H. Winslow, Superior, Wis.; Secretary-Treasurer, Henry Harmon, Milwaukee, Wis.

"THE GREAT GAS WHITE WAY"

Patented April 25, 1911

The latest, most effective and most economical, method of street lighting, with the most attractive and ornamental fixtures, is with the

"SUN" GASOLABRA

The Sun Gasolabra is used with either artificial, or natural gas. The lamps are made with one, two, three, four or five lights and with single or double burners. The five-way lamp, with double burners, will give about 750 C. P. (actual) to a standard on artificial, and 1,000 C. P. (actual) on natural gas.

Light Up the Front of Your Store or Office

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And Start a "Great Gas White Way"

Write for illustrated folder, and address of nearest agent, to

THE SUN VAPOR STREET LIGHT CO.

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Patented April 25, 1911

SOUTH CHESTER TUBE COMPANY,

CHESTER, PA.

WROUGHT IRON LINE AND DRIVE PIPE. TUBING AND CASING.

Our Line Pipe is strictly and solely Wrought Iron, insuring long life and high resistance to corrosion.

Each coupling is threaded to a taper and the ends of each length of pipe are equipped with taper threads to exactly conform to the taper in the coupling. Ends of pipe are reamed and the couplings are recessed to cover the last thread on the pipe, adding strength and protection to the weakest point.

The only way to obtain satisfactory joints is to have taper on both pipe and coupling to lock threads.

P. N. GUTHRIE, Jr., Sales Agent, - 30 Church St., New York City.

Dixon's Pipe Joint Compound

AND

Dixon's Silica Graphite Paint

ARE OF

GREAT VALUE

TO

GAS COMPANIES.

MAY WE TELL YOU ABOUT THEM?

JOSEPH DIXON CRUCIBLE COMPANY,

JERSEY CITY, N. J.

SEE SPECIAL SUBSCRIPTION OFFER, PAGE 962.

POSITIONS WANTED.

By a young married man, 35 years of age, 16 years' experience in all departments of the gas business, the past 9 years as a street foreman. Desires to change present location. Will go anywhere.

Address, "C. B. C.,"
1875-1 Care this Journal.

Position as MANAGER of a gas company or as SUPERINTENDENT of a by-product coke oven plant.
Address, "E. P. J.,"
1875 4 Care this Journal.

GAS COMPANIES, ATTENTION!

I will open a new set or readjust your present system of bookkeeping to conform with the uniform system of accounts as required by the States of New York and New Jersey, and will audit same at reasonable rates. Address, "P.."
1875-1 Care this Journal.

POSITIONS OPEN.

Wanted, an experienced FOREMAN for gasfitting shop. Must have held similar position and have good experiences. Excellent opportunity for capable man.

Address, "STATE N. Y.,"
1875-2 Care this Journal.

Wanted, a GOOD GASFITTER for summer month. A good place for men troubled with hay fever.

SAULT STE. MARIE GAS & ELECTRIC CO.,
1874-2 SAULT STE. MARIE, MICH.

Wanted, two experienced GASFITTERS for regular gas company work on meters and appliances. Must be able to do first-class work. Furnish references. Company within 75 miles New York; city of 30,000.

Address, "H. F.,"
1874-2 Care this Journal.

Wanted at once, TWO GOOD DRAFTSMEN for steady situation. Those experienced with construction of gas apparatus preferred. Give experience, training, references and salary required.

Address,
THE WESTERN GAS CONSTRUCTION CO.,
1875-1 Fort Wayne, Ind.

MISCELLANEOUS.

ATTENTION!

Will party advertising under key of "OPERATOR" please communicate at once with the Publishers of the American Gas Light Journal?

FOR SALE,

ONE SEVEN-FOOT SIX-INCH U. G. I. WATER GAS SET.—This machine is complete with the exception of condenser, and is being replaced with larger apparatus. Immediate shipment can be made. Inquiries should be addressed to

SUPERINTENDENT, SPRINGFIELD GAS LIGHT COMPANY,
Springfield, Mass.
1872-tf

FOR SALE,

One hundred barrels of coal tar, $2.10 per barrel, f.o.b. boat or cars, Soo, Michigan.

SAULT STE. MARIE GAS & ELECTRIC CO.,
1874-2 SAULT STE. MARIE, MICH.

FOR SALE.

On account of changes to building it is necessary for us to dispose of the U. G. I. set, which is complete with the exception of condenser; 8-foot 6-inch generator with 7-foot 6-inch carburetter and superheater. For particulars and price address Superintendent, Lowell Gas Light Co., Lowell, Mass.
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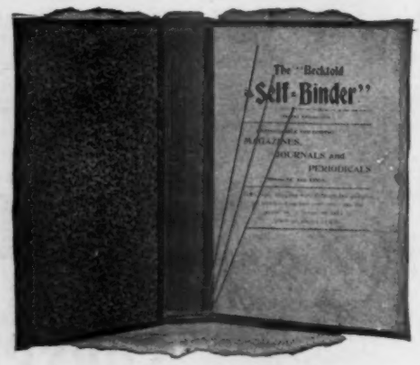

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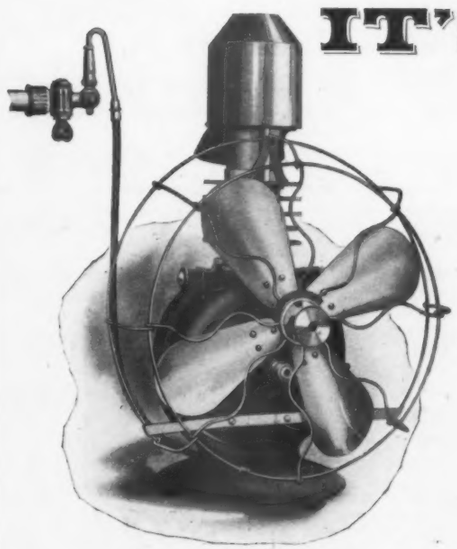

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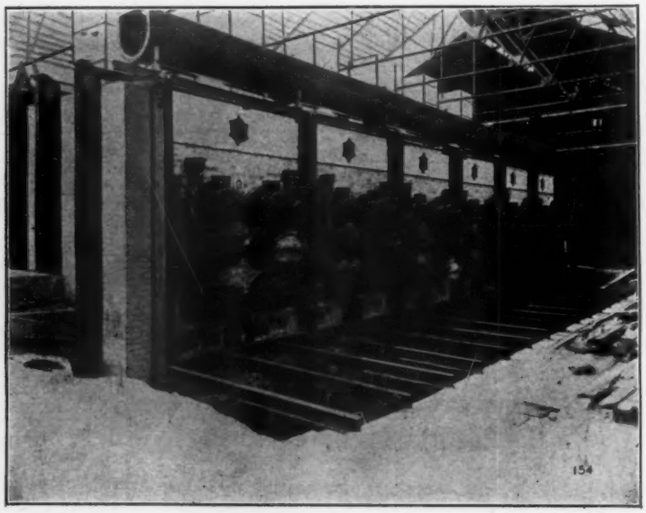

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A RESULT OF CONCENTRATION

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It is but the natural result of our studied effort to make the Doherty Economizer Bench the very best bench on the market, regardless of cost.

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LITTLE HINTS.

You know, as well as I do, that a cheap paint will prove dear unless cheapness is the result of economic production factors. What do you think a friend of mine said the other day? Listen! "Little, I would like to use your paint, but it is too cheap for me to trust on an $80,000 holder." He spoke without thinking, or, more likely, through want of perception of our principles. He did actually use our paint, and I will tell you why.

First—I'll admit our paint is cheap. It ought to be. Here's how. We dig our mineral with a steam shovel, wash it by special machinery, load direct to cars, roast it in inclined retorts, and it passes from its earthly bed to the paint pot without being touched by hand. Take our wet grinding house and see what we have done to save you money and to make it possible for you to buy, at a dollar and a half, a gallon of paint worth three dollars. We elevate all the crude materials by machinery and they gravitate to the keg, cask or can. French burr stones grind, in oil, a pigment that has been dry ground and air floated to 200 mesh—(40,000 pieces, separated by the silk test screen, cover one inch—count them if you like)

Then—We sell to you direct and not through a dealer. I am not so expert that I can "dope" a paint and "get away with it," so you can be sure we do not intend to throw away our advertising by losing (through bad results) a customer once on our books. Let me tell you, however, there are more ills in a pot of paint than were ever dreamt of in your philosophy. Some ingredients are so "fishy" they will not bear inspection. A lot of fish oil is a dangerous thing—a little is devoutly to be desired. It is to linseed oil what india rubber is to a rain coat. It sheds the water. However, rubber solution alone is not much good as an overcoat, just as fish oil is no good without some linseed. Some pigments are so poor they do not deserve a good oil vehicle. You see, therefore, that with all our machinery and our method, there would be madness in our method if we mined any kind of muck. **You** do not try and make gas from peat: neither do **we** make paint from talcum powder. The best that can be had, and that prepared in the most scientific way at the lowest cost. How else could we hope to sell paint? There are paint companies by the million, more or less, making and trying to sell paint, but so far as the gas trade is concerned there will soon be only one company.

NOW—We know what a gas works is and the conditions met with. That is why we can give you a holder paint, or one for your brick buildings, your meters and your smokestacks, designed for the particular purpose to which it is to be put. It costs you a dollar and a half a gallon—if it cost four times that you could not afford to be without it. That is not what we say—it is the unsolicited testimonial of a man who painted his ammonia tanks, alongside of a purifier house, and who uses it on all of his tank cars.

Answer this—and it is no riddle—"Why do paint makers buy and use our paint?"

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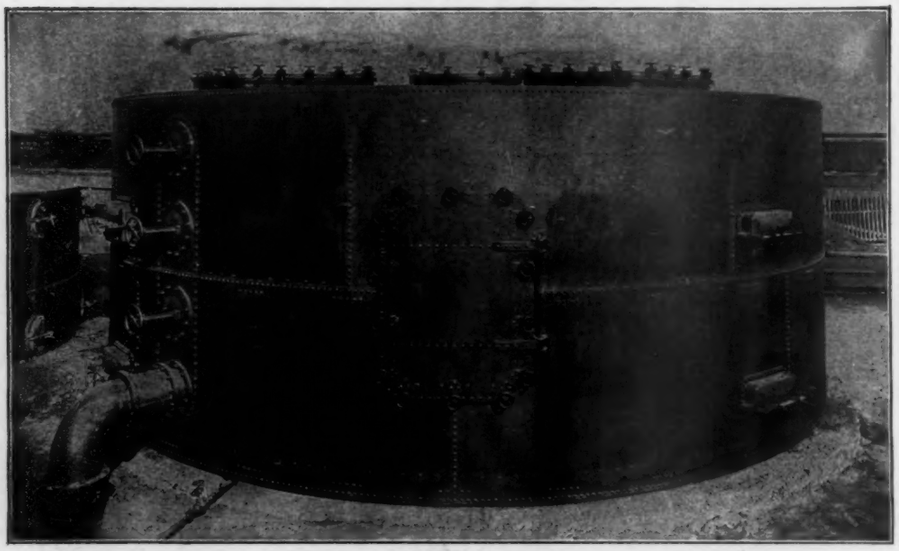

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Our Plants are Equipped for Handling the Largest Contracts.
Our Products are Manufactured from Clays Taken from Our Own Mines.

PUBLIC LIGHTING TABLE FOR MAY, 1911.

[Communicated by The American Meter Company.]

Day of Week.	MOONLIGHT SCHEDULE.		
	Date.	Light.	Extinguish.
Monday	1	7.20 P.M.	4.00 A.M.
Tuesday	2	7.20	4.00
Wednesday	3	11.50	4.00
Thursday	4	12.30 A.M.	4.00
Friday	5	1.00 F.Q.	4.00
Saturday	6	1.30	4.00
Sunday	7	2.00	3.50
Monday	8	2.20	3.50
Tuesday	9	2.40	3.50
Wednesday	10	3.00	3.50
Thursday	11	No L.	No L.
Friday	12	No L. F.M.	No L.
Saturday	13	No L.	No L.
Sunday	14	7.40 P.M.	9.50 P.M.
Monday	15	7.40	10.50
Tuesday	16	7.40	11.40
Wednesday	17	7.40	12.30 A.M.
Thursday	18	7.40	1.10
Friday	19	7.40	1.40
Saturday	20	7.40 L.Q.	2.10
Sunday	21	7.40	2.40
Monday	22	7.40	3.00
Tuesday	23	7.40	3.30
Wednesday	24	7.40	3.40
Thursday	25	7.40	3.40
Friday	26	7.40	3.40
Saturday	27	7.40 N.M.	3.40
Sunday	28	7.50	3.40
Monday	29	7.50	3.40
Tuesday	30	7.50	3.40
Wednesday	31	7.50	3.40

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ARRANGED FOR ORNAMENTAL STREET LIGHTING IN CONNECTION WITH BOULEVARD LAMP POST.

Lamp is made of heavy sheet steel porcelain enameled throughout.

Slidable Chimney perfectly protects mantle when globe is removed for cleaning.

Uses 9-inch Ball Globe, Half Frosted, Opal or Acid Roughed.

Gas Consumption, 3 feet per hour. Candle power, 119.

POST furnished complete with fittings.

A COMBINATION PERFECTLY ADAPTED TO SECURE CITY STREET LIGHTING CONTRACTS.

Full Information and Prices furnished on application.

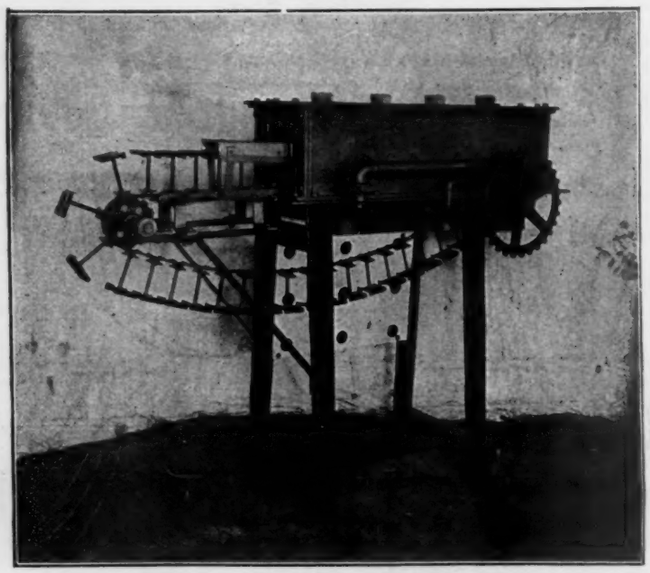
AMERICAN GAS LIGHT COMPANY,

KALAMAZOO, MICHIGAN.

BOSTON, MASS. MANCHESTER, ENGLAND.

GAS FURNACES AND HEATING MACHINES

No. 54 Heating Machine.



This MACHINE recommended for ANNEALING or HARDENING NEEDLES, STEEL PINS and similar work.

"Heating Machines" are Furnaces provided with carriers or propelling machinery for the Continuous Transmission of Work through heated space, for Annealing, Brazing, Hardening and Tempering Quantities.

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INDUSTRIAL PURPOSES.

A MOST PROFITABLE DEPARTMENT FOR GAS COMPANIES.

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Pressure Blowers, Heating Machines,
Gas Blast Furnaces, Blow Pipes and Burners.

STATE

AMOUNT - } OF WORK
SIZE - - } to be done in
KIND - - } given time.

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TO GET PROMPT SHIPMENT.

HUMPHREY AUTOMATIC GAS WATER HEATERS

Have the valve at the top; easy and cheap to connect; a sootless bunsen flash pilot; a galvanized, rust-proof, non-clogging burner, and many other things making for trouble freedom and high efficiency. ∴ ∴ ∴ ∴

GUARANTEED.

They Make Pleased Users

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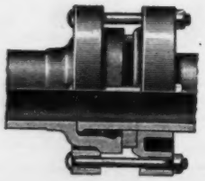
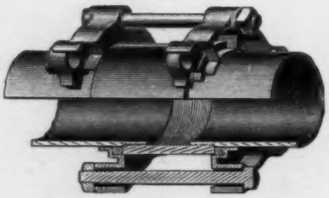


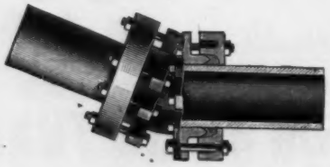
Clamp for Bell and Spigot Joints.

Style 4½.



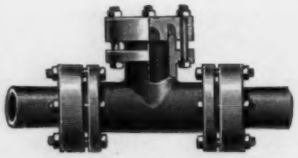
Clamp for Screw Collar.

Style 4.



Angle Couplings.

Style 28.



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Style 30.

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Specialties for Gas Lines.

Pipe Couplings, Sleeves, Clamps, Crosses, Tees and Ells.

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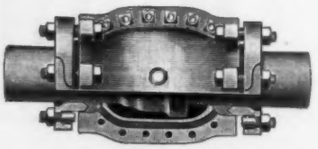
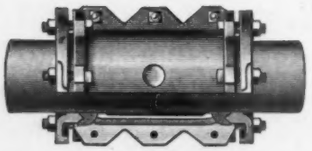


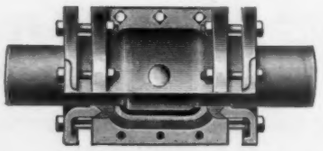
Heavy Split Sleeve for Cast Iron Pipe.

Style 26.



Light Split Sleeve for Cast Iron Pipe.

Style 27.



Light Split Sleeve for Wrought Iron Pipe.

Style 13.

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U. S. A.

Our Baby Began to Thump the Chairs

So we said, "We must buy a piano."

But we Quakers didn't know anything about pianos.

All the piano agents in the State somehow found out we wanted a piano, and the fun was on.

Every mother's son of them had a piano which "deed-and-double," "cross-my-breath," was "as good as a Steinway."

So we went off and bought a Steinway. And have it yet, as good as new.

"But what in the world has that rig-a-ma-role got to do with elevators?"

Oh, nothing, Henry, except that the Steinway folks have just discovered the Steam Hydraulic Elevator.

And hereafter the greatest pianos in the world will be taken up and down stairs in their factories by the greatest elevators in the world.

Now, isn't a gas works—a dirty, stinkin', grimy old gas works—just as much in need of good elevators as a fancy piano factory?

If you don't have good light there can't be good music. So smart Gas Men everywhere

"Hook 'er to the Biler."

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ELEVATOR MAKERS TO FOLKS WHO KNOW.

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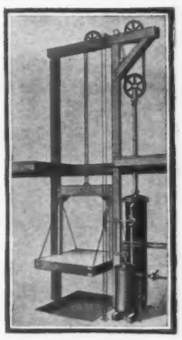

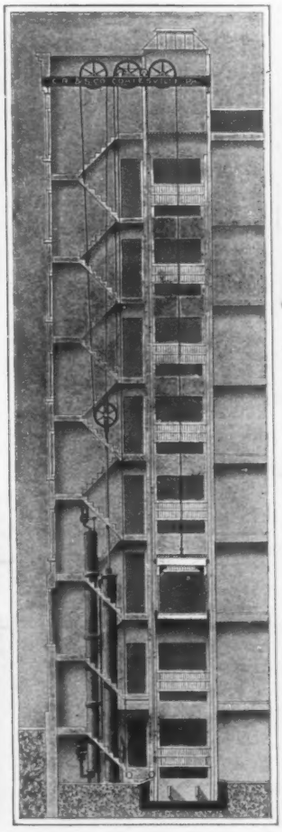

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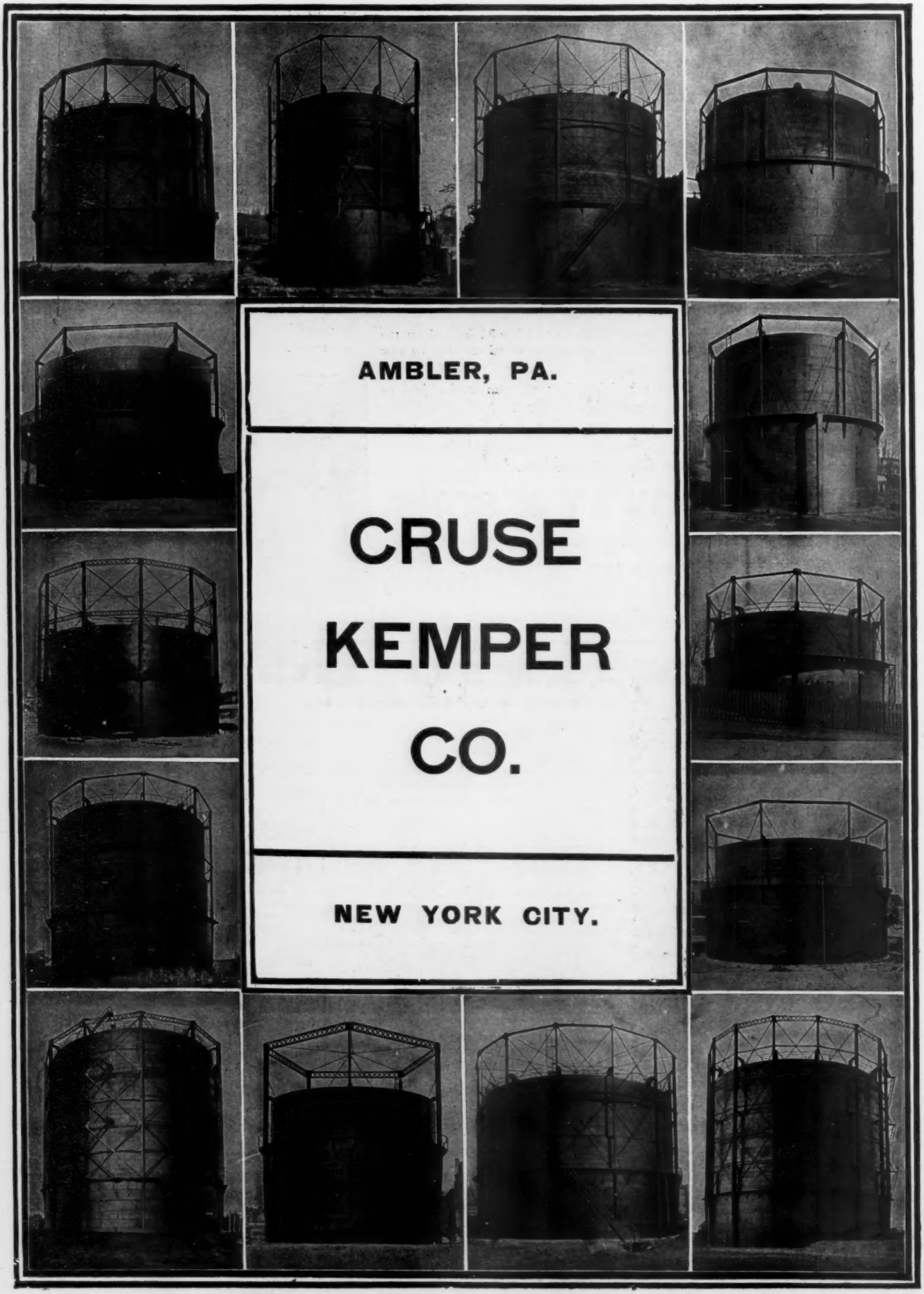
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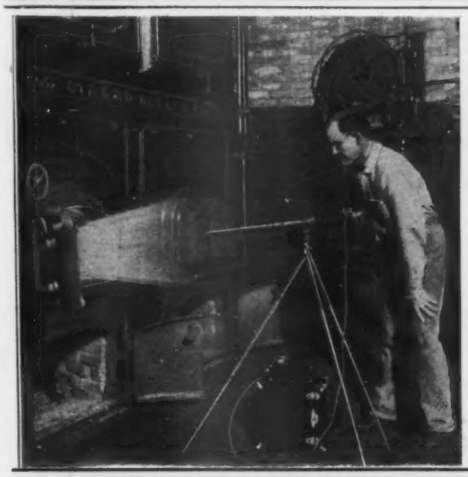

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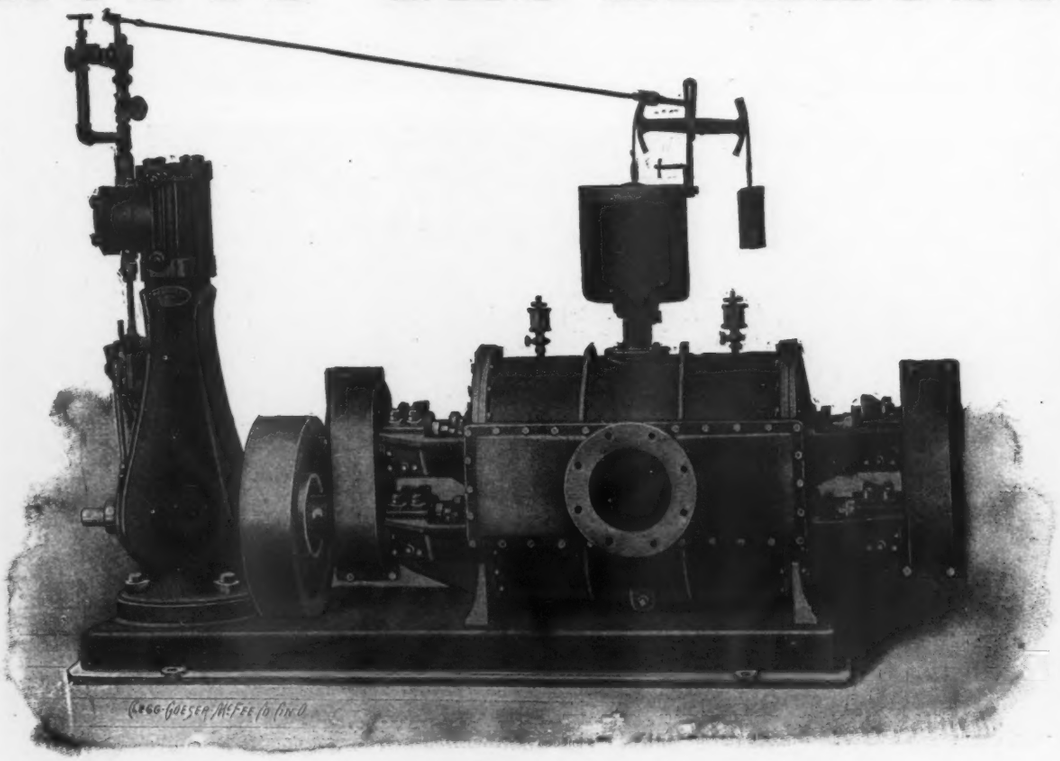

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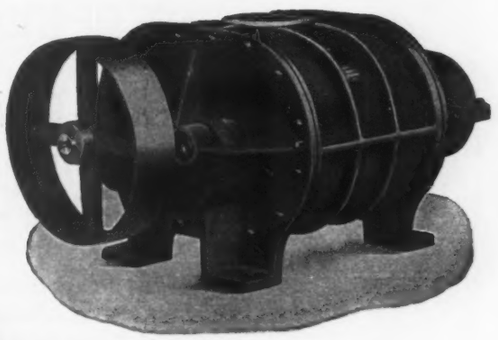

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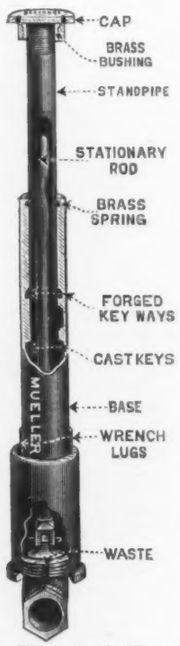

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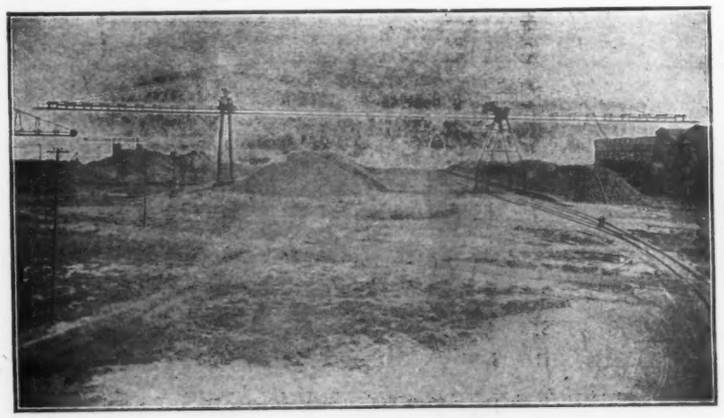

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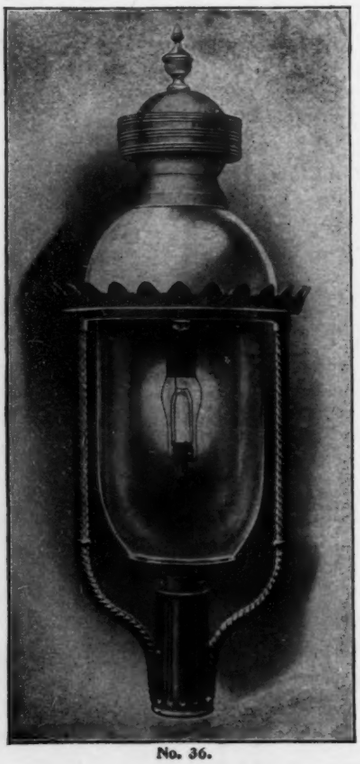

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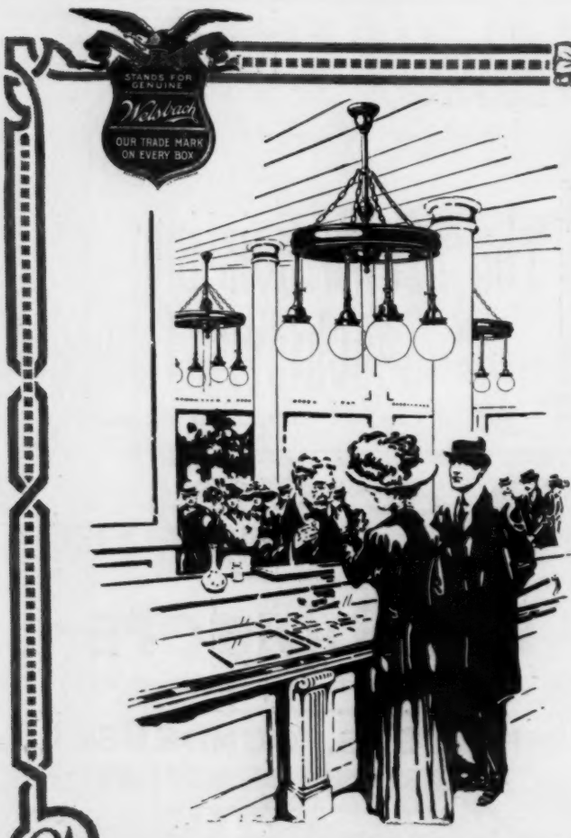

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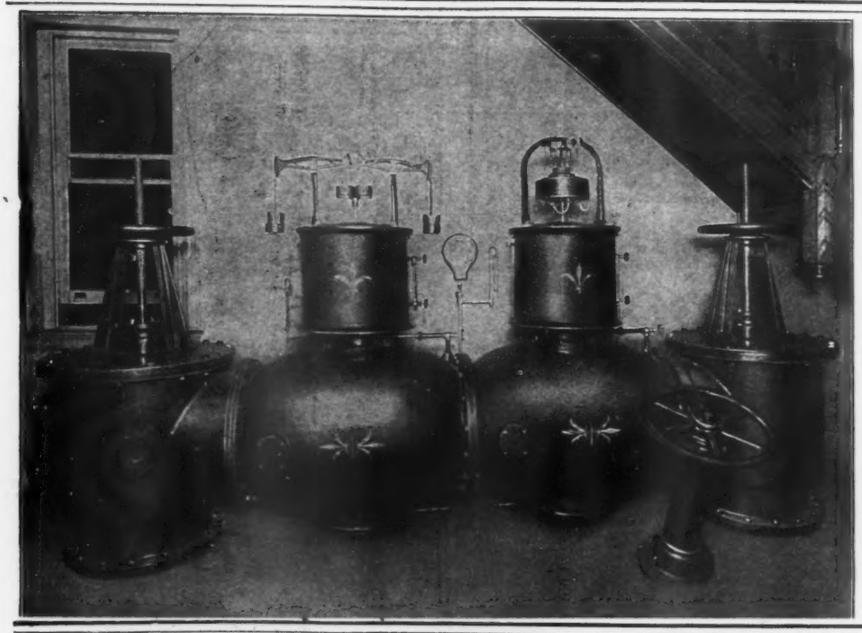

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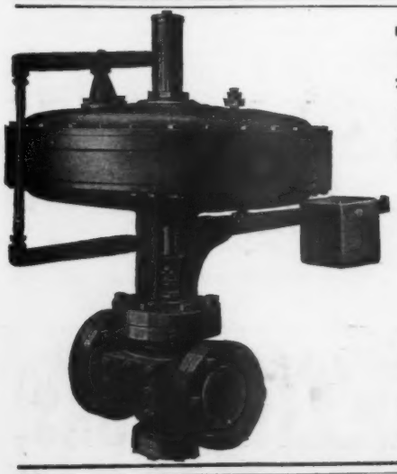

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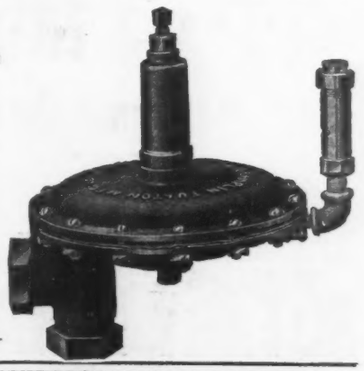

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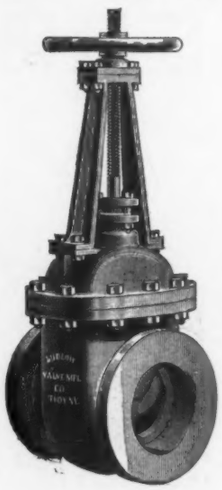

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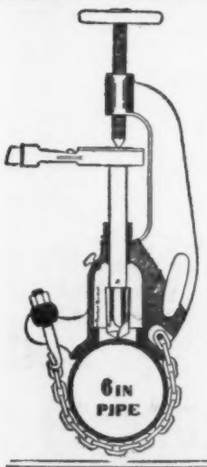

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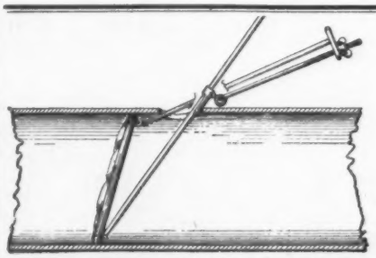

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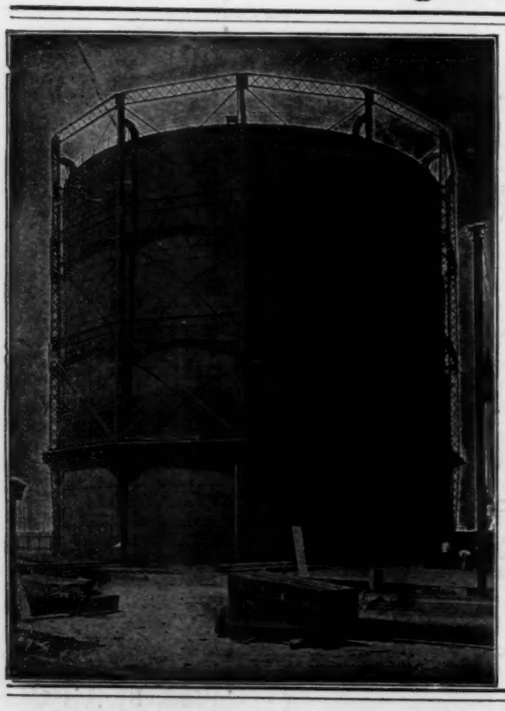

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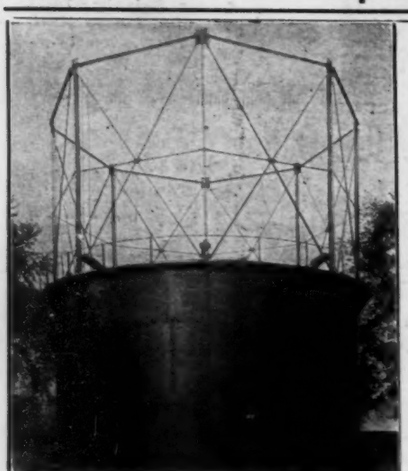

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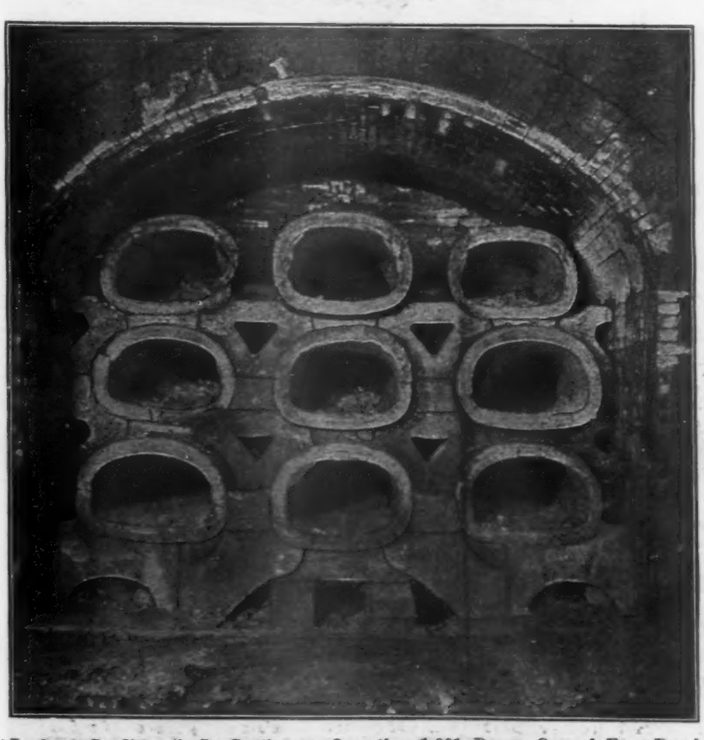

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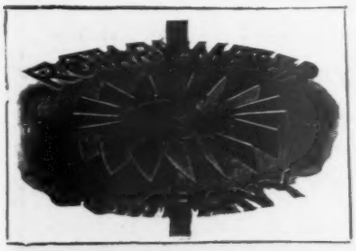

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